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ABSTRACT

This report, fifth of a series on Academic Health Centers (AHCs), addresses the fundamental rationale of such centers: the education of the health care workforce. None of the missions of the 125 AHCs in the United States, medical schools and their closely affiliated hospitals and physician groups, is more important than the education of physicians. This report begins with sections that outline the organization and size of the medical education enterprise, how medical education is financed, the unique role of AHCs in the medical education process, and the importance of medical education to various individuals and organizations in U.S. society. Also presented are the findings of the Task Force on Academic Health of the Commonwealth Fund on the nature and extent of the challenges facing AHCs and their educational missions and how AHCs have responded to these challenges. The next section presents a set of conclusions and guiding principles based on the findings. The final section contains recommendations grouped into those for AHCs, accreditation and similar groups, and public policy. Findings make it apparent that the content and quality of physician training will remain vital for the foreseeable future to the health of the U.S. population and the effective functioning of the U.S. health care system. The data available are not sufficient to judge the performance of AHCs in discharging their educational responsibilities beyond establishing a minimum level of competency. AHCs should be held accountable for their performance in educating U.S. physicians, and the extra clinical costs associated with the educational missions of AHCs should be borne broadly and fairly by the beneficiaries of the educational activities of these institutions. (Contains 10 figures, 7 tables, and 99 endnotes.) (SLD)

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TRAINING TOMORROW'S DOCTORS

The Medical Education Mission of Academic Health Centers

A Report of The Commonwealth Fund
Task Force on Academic Health Centers

April 2002

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PROLOGUE

Training Tomorrow's Doctors: The Medical Education Mission of Academic Health Centers marks the fifth in a series of reports prepared by the Commonwealth Fund Task Force on Academic Health Centers to examine the impact of health system change on the social and academic missions of these institutions. These missions consist of teaching, research, the provision of highly specialized services, and continuous innovation in patient care.

The first report of the Task Force, *Leveling the Playing Field,* explored the effects of competition in health care markets on the organization and financing of the academic health center (AHC) enterprise. In the second report, *From Bench to Bedside,* the Task Force examined the status of AHCs' research mission, made recommendations for distributing federal research funds, and explored how AHCs could improve their internal management of research activities. The Task Force's third report, *Health Care at the Cutting Edge,* described the crucial roles played by AHCs in the development and delivery of highly specialized, technologically complex medical services and suggested ways in which government policy could support such activities. The fourth report, *A Shared Responsibility,* documented the contributions of AHCs, particularly those that are publicly owned, in providing medical care to indigent and uninsured patients; it also recommended ways to distribute public funds more rationally among hospitals in order to improve access to care in the absence of universal insurance coverage. This fifth and final report on AHCs' missions addresses what is perhaps the fundamental rationale for their existence: the education of the nation's health care workforce.

Medical education in the United States faces a number of challenges, including the rapid increase in biomedical knowledge, constraints on cross-subsidies from clinical activities, and fundamental changes in how adults are educated in a medical setting. Despite these developments, the Task Force has found that AHCs have largely succeeded in sustaining the essence of their educational activities. In this report, the Task Force recommends steps that medical schools and AHCs, accrediting organizations, and government can take to foster continued improvement and reform of medical education and its financing.

We are grateful to The Commonwealth Fund for its support of this project and to the members of the Task Force and its staff for their wisdom and hard work. In the future, we hope that the Task Force will contribute to further understanding of how the nation can promote the effectiveness and efficiency with which it conducts the social missions of AHCs.

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EXECUTIVE SUMMARY

In addition to their unique mission of training the next generation of health care professionals, the nation's 125 academic health centers (AHCs)—medical schools and their closely affiliated hospitals and physician groups—perform services that benefit all of society. As institutions, AHCs conduct biomedical research to improve the quality and effectiveness of medical care, provide highly specialized health care services, and care for the poor and underserved.

Although these other missions of AHCs sometimes receive more attention, none is more important to the future of the American health care system than the education of physicians. This report of the Commonwealth Fund Task Force on Academic Health Centers is intended as a resource to guide future policy development in the field of medical education.

This report begins with sections that outline the organization and size of the medical education enterprise, how medical education is financed, the unique role of AHCs in the medical education process, and the importance of medical education to various individuals and organizations in our society. Next are presented the Task Force findings on the nature and extent of the challenges facing AHCs and their educational missions, as well as how AHCs have responded to these challenges. The next section presents a set of conclusions and guiding principles based on the findings. The final section presents recommendations grouped as those for AHCs, accreditation and similar groups, and public policy. The findings, conclusions and principles, and recommendations are summarized in the following lists.

Findings

The first six findings in this report relate to the nature and extent of the challenges facing the educational mission of AHCs.

1. The scientific basis of medical practice expands exponentially.
2. The nature and demands of medical practice are changing.
3. Methods of instruction in medical education evolve at a rapid pace. Innovations can be costly to implement and to sustain over time.
4. The clinical environment within AHCs is widely perceived as unreceptive to medical education.

5. Pressures on the clinical enterprise undermine financial support for medical education.

6. The medical education activities of faculty are valued less than research and patient care at AHCs.

The second set of findings demonstrate how AHCs are responding to the challenges facing their educational missions.

7. AHCs are undertaking reforms to prepare physicians better for the demands of modern medical practice, such as practice in ambulatory and community-based settings.

8. AHCs seem to have succeeded in preserving the quality of their educational missions from environmental and financial pressures.

9. AHCs vary considerably in their use of educational innovations and reforms and in addressing the perceived inadequacies in their curriculum.

10. The quality of GME instruction in nonhospital settings lags behind that found in traditional settings.

11. The quality of training may vary systematically from one training program to another.

12. The number of underrepresented minorities in medical schools remains below their proportion in the population as a whole.

13. Data are inadequate to gauge the performance of AHCs in conducting their educational missions.

Conclusions and Principles

Based on these findings the Task Force has developed a series of conclusions and principles related to medical education to inform the attitudes and activities of policymakers, managers, and educators.

Conclusions

- The content and quality of physician training will remain vital for the foreseeable future to the health of the American people, their peace of mind, and the effective functioning of the American health care system.

- AHCs play a critical role in the training of American physicians and have a number of unique advantages for performing this task.
- Government has a legitimate concern with assuring the competence of our physician workforce and thus with the training missions of AHCs.
- AHCs face significant challenges in fulfilling their educational roles.
- The available data are insufficient to judge the performance of AHCs in discharging their educational responsibilities beyond establishing a minimum level of competency.

Principles

- AHCs should be held accountable for their performance in educating the nation's physicians.
- The extra clinical costs associated with the educational missions of AHCs should be borne broadly and fairly by the beneficiaries of the educational activities of these institutions.

Recommendations

Drawing on the findings, conclusions, and principles, the Task Force makes the following recommendations.

Recommendations for AHCs

- AHCs should include the continuous improvement of medical education among their highest priorities.
- AHCs should develop new ways to measure the costs and quality of their medical education missions.
- AHCs should establish mechanisms that encourage faculty to engage in educational activities and to expand and improve their teaching skills.
- Academic health centers should increase efforts to recruit underrepresented minorities and to prepare young physicians to care for an increasingly diverse population.

Recommendation for Accrediting Organizations and Similar Groups

- Accrediting organizations and medical professional organizations should take a leadership role in assisting AHCs to develop the methods needed to train physicians to be lifelong learners and should develop new capabilities to measure the costs and quality of the medical education mission.

Recommendations for Public Policy

- Government should support research and development to produce valid and reliable measures of the costs and quality of UME and GME.
- A comprehensive public strategy is needed to cover the added costs of clinical care that accompany medical education activities. This strategy should establish a stable and explicit source of funding for medical education and should distribute these costs broadly and equitably among those who benefit from medical education. Further, this strategy should allow AHCs to compete with other providers of health care services.
- Until a strategy is developed, federal and state governments should continue to pay their fair share of the incremental clinical costs associated with UME and GME.

I. INTRODUCTION

As a society, we are experiencing a period of revolutionary change in the science and practice of medicine. The pace of advances in medical knowledge is unprecedented, as is the pace of change in the organization and financing of health care services. In the space of a decade, the human genome was mapped, managed care fundamentally altered the delivery of care, and the information revolution fueled the empowerment of health care consumers as never before. Everything in health care seems different.

Yet some things remain constant. Despite fundamental shifts in medical science and the structure of the health care system, the overwhelming majority of Americans continue to get their health care in direct interactions with physicians, who thus bear most of the responsibility of guiding patients through an increasingly complex health care environment. At present, the physician remains a critical factor in determining the quality and cost of care received by the American public. That means, in turn, that the quality of medical students and residents and the nature of their educational experiences continue to play a critical role in realizing the objectives of our health care system. It follows that the education of physicians and their familiarity with and ability to use new medical discoveries and to manage a system in turmoil has never been more important.

The education of our nation's physicians occurs primarily in academic health centers (AHCs)—the 125 medical schools and their affiliated or owned clinical facilities. These institutions also play a critical role in other activities vital to the health and welfare of Americans, such as the conduct of biomedical research, the provision of high technology and specialized services, and the care of poor and uninsured patients. Though these social missions of AHCs sometimes receive more attention, none is more important to the future of the American health care system than the education of future physicians during these fast-changing times. This report of the Commonwealth Fund Task Force on Academic Health Centers examines the current status of the educational mission of AHCs and makes recommendations to improve the conduct of that mission by AHCs.

The field of medical education is both wide and deep. More than one professional journal is dedicated to studies and commentary on this field, and numerous governmental, quasi-governmental, and independent organizations track issues in medical education and the formulation of related public policy. The Task Force has benefited greatly from reports and position papers by the Council on Graduate Medical Education (COGME), the Medicare Payment Advisory Commission (MedPAC), the Pew Health Professions

Commission, the Accreditation Council on Graduate Medical Education (ACGME), the Association of American Medical Colleges (AAMC), the American Medical Association (AMA), and others.

The goal of the Task Force in writing this report is neither to replicate all of this work nor to summarize it fully. Rather, with this report the Task Force seeks to understand the implications of educating American physicians predominantly in institutions that face a particular set of financial, clinical, organizational, and cultural challenges at the current time. The development of medical education policy and management must be informed by a full appreciation of the current status of these institutions, and their role in the training of physicians.

The report is organized into four sections. A background section describes certain basic characteristics of the medical education system in the United States. A second section reviews the major findings of the Task Force regarding the educational mission of AHCs. These findings detail the challenges facing this educational mission, how AHCs have responded, and where more work is needed. A conclusions and principles section summarizes the Task Force's findings and the principles that guide its subsequent recommendations. The last section provides those recommendations, which concern both public policy and private management of medical education.

II. BACKGROUND ON THE ORGANIZATION AND SIZE OF THE MEDICAL EDUCATION ENTERPRISE

Medical education takes place in two stages. The first—undergraduate medical education (UME)—consists of the four years that students spend in medical school. The second stage of medical education, commonly referred to as graduate medical education (GME), begins after medical school and consists of several years of residency followed by additional postresidency training for those who pursue subspecialization. This report addresses UME and the residency period of GME.

Undergraduate Medical Education

Traditionally, UME has been divided into two segments, each two years in length. During the first two-year segment of medical school (often referred to as the preclinical years), students focus primarily on developing a deeper understanding of the sciences underlying modern medicine, such as biochemistry, microbiology, anatomy and physiology, immunology, pathophysiology, genetics, and pharmacology. Students also participate in introductory clinical activities during this period, which introduce them to the basics of taking a medical history and conducting a physical examination.

The second two-year segment of UME (usually referred to as the clinical years) focuses on instruction in the major clinical disciplines, such as surgery, internal medicine, obstetrics and gynecology, pediatrics, and psychiatry. The goal of the clinical years is to "familiarize students with the structure, function and behavior of the human organism in health and disease, to acquaint them with the causes, physiological disturbances and the natural history of various diseases, to provide an introduction to the principles of therapeutics and surgery, and to present the environmental and social influences."[1]

In most medical schools, the faculty (which includes those in the basic and clinical sciences) is responsible for the content of undergraduate medical education. The curricula of the first two years are subject to continuous review and debate among faculty representing the core scientific disciplines. In the latter two years, control over the content of medical education passes to the clinical faculty in the AHCs' clinical affiliates. There, chairpersons of clinical departments (such as medicine, surgery, or pediatrics) and directors of clinical units (such as cardiology, nephrology, cardiac surgery, or urology) assume responsibility for the content and quality of the UME experience. Students rotate for designated intervals through particular clinical settings in which they learn more advanced diagnostic skills and the rudiments of treatment.

Several interlocking bodies serve to ensure the quality of medical education at the national level. The Liaison Committee on Medical Education (LCME) accredits medical schools for the purpose of assuring the quality of students' education. The LCME is a joint activity of the Council on Medical Education of the AMA and the AAMC. Representatives of the LCME visit each medical school on a regular basis to assess whether its curriculum and the experiences of its students meet national standards of function, structure, and performance. Participation in federal student loan programs requires accreditation by the LCME. Most states require graduation from an accredited school as a condition of licensure.

On the national level, the National Board of Medical Examiners (NBME) and the Federation of State Medical Boards (FSMB) cosponsor the United States Medical Licensing Examination (USMLE™), a three-step examination for medical licensure. Most medical licensing authorities in the United States require passage of this exam before granting an initial license to practice medicine. Students normally must pass at least two of the three steps before entering an ACGME-approved residency or fellowship program. Through its program of certification, the Educational Commission for Foreign Medical Graduates (ECFMG®) performs a similar service for physicians from foreign medical schools who wish to practice in the United States.

Over the last 40 years, the size of the UME enterprise has grown dramatically (Table 1). The number of medical students doubled from 30,288 in 1960 to 66,489 in 1998.[1,2] Virtually all of this growth occurred from 1960 to 1980, when the number of fully accredited four-year medical schools increased from 81 to 115 and the average size of a freshman class increased from 8,069 to 16,590 nationally.[3]

[1] In keeping with the previous work of the Task Force, the educational contributions of the nation's 19 accredited osteopathic medical schools are not considered in this report.

Table 1
Changes in the Size of UME, 1960–1999

Year	Fully Accredited Four-Year Medical Schools	First-Year Entrants	Total Medical Students
1960–61	81	8,069	30,288
1965–66	84	8,554	32,835
1970–71	87	11,169	40,487
1975–76	109	14,898	55,818
1980–81	115	16,590	65,189
1985–86	126	16,268	66,585
1990–91	125[a]	15,998	65,163
1995–96	124[b]	16,253	66,970
1998–99	124	16,170	66,489

[a] The decrease of 126 to 125 reflects the closure of the Medical School at Oral Roberts University in 1990–91.

[b] The decrease from 125 to 124 reflects the merger of Medical College of Pennsylvania and Hahnemann University in 1995.

Note: As of 2000–01, four medical schools are in the process of being opened. These include allopathic schools in Texas and Florida and two osteopathic schools.

Source: *AAMC Data Book: Statistical Information Related to Medical Schools and Teaching Hospitals*, January 2000. Washington, D.C.; Association of American Medical Colleges.

Graduate Medical Education

Graduate medical education typically lasts from three to nine years, depending on specialty, and consists of intense, experiential learning in the actual practice of medicine. The fundamental goal for residents is the development of clinical skills, primarily by providing direct patient care under the supervision and with the instruction of senior physicians, who make up the clinical faculty of medical schools and their associated teaching institutions. GME also includes a substantial component of didactic training designed to convey the knowledge essential to diagnosis and treatment. Didactic sessions include attending rounds, seminars, lectures, and reading in specific fields relevant to practice. During GME, medical students truly become physicians. At the completion of their residency, new physicians should be capable of handling independently all the major medical problems in their core disciplines.

The content and quality of graduate medical education is supervised by the ACGME, which includes representatives of all major medical disciplines. Under the aegis of the ACGME, 24 Residency Review Committees (RRCs) accredit all residency programs in their disciplines within the U.S. RRCs visit each program on a regular basis, review the content of the clinical and didactic programs in which residents participate,

interview residents concerning their experiences, and make recommendations for improvement. The quality standards applied by the ACGME and its RRCs currently are based on structure and process rather than outcomes. Thus, the ACGME assesses whether the residents' experiences conform to a set of standards, but not whether program graduates are objectively competent to perform essential clinical tasks. Recently, however, the ACGME has initiated a multi-year initiative to develop and implement measures of residents' competency in six core areas,[4] which eventually will be incorporated into accreditation.

Another assurance of the competency of graduating residents is provided by medical disciplines themselves through the process of board certification. National panels of physicians from each major discipline (Medical Specialty Boards) meet regularly and compose examinations (National Certifying Exams). Physicians who pass those exams receive board certification, which provides further evidence that they have mastered the content of their disciplines. Some boards now require that physicians take these exams at periodic intervals throughout their careers (a process known as recertification) if they wish to remain board certified. Passage of national boards is not a precondition of licensure and practice, and physicians are free to advertise themselves as practitioners of a particular discipline without board certification.

The overall size of the GME enterprise has increased dramatically over the last 40 years. The total number of residents in U.S. clinical facilities has increased from 37,562 in 1960 to 97,989 in 1999 (Table 2). Among the many reasons for this growth are the growth in the UME enterprise, the increasing complexity of medical care (requiring longer periods of clinical training), the increased reliance of hospitals on residents as a source of labor, Medicare program incentives that encourage hospitals to increase the size of GME programs, the lack of a single national organization with the power to control the overall size of the GME enterprise, and an influx of graduates from foreign medical schools to U.S. residency programs.[5] From 1960 to 1999 the number of resident physicians who graduated from foreign medical schools increased from 9,935 to 25,880 (Table 2).

Table 2
Trends in GME Trainees, 1960–1999

Year	Total Residents[a]	IMG Residents (no.)[a]	IMG Residents (%)[b]	Non-IMG Residents (no.)[c,d]	Non-IMG Residents (%)[e]
1960	37,562	9,935	26.4	27,627	73.6
1970	51,015	16,307	32.0	34,708	68.0
1980	61,465	12,078	19.7	49,387	80.3
1981	68,217	13,194	19.3	55,023	80.6
1982	69,142	13,123	19.0	56,019	81.0
1983	72,397	13,221	18.3	59,176	81.6
1984	75,125	13,337	17.8	61,788	82.1
1985	74,514	12,509	16.8	62,005	83.2
1986	76,815	12,035	15.7	64,780	84.3
1987	81,410	12,712	15.6	68,698	84.4
1988	81,093	12,433	15.3	68,660	84.7
1989	71,909	12,259	17.0	59,650	83.0
1990	82,902	14,914	18.0	67,988	82.0
1991	86,217	17,279	20.0	68,938	80.0
1992	89,368	19,264	21.6	70,104	80.0
1993	97,370	22,721	23.3	74,649	76.7
1994	97,832	23,499	24.0	74,333	76.0
1995	98,035	24,982	25.5	73,053	74.5
1996	98,076	24,703	25.2	73,373	74.8
1997	98,143	25,531	26.0	72,612	74.0
1998	97,383	25,415	26.1	71,968	73.9
1999	97,989	25,880	26.4	72,109	73.6

[a] Data from *Journal of the American Medical Association* Medical Education Issues, Graduate Medical Education Reports: 2000—Vol. 284, No. 9; 1999—Vol. 282, No. 9; 1993—Vol. 270, No. 9; 1992—Vol. 268, No. 9; 1991—Vol. 266, No. 7; 1990—Vol. 264, No. 7; 1989—Vol. 262, No. 8; 1986—Vol. 256, No. 12; 1983—Vol. 250, No. 12; 1976—Vol. 236, No. 26.

[b] Number of IMG Residents/Total Residents x 100.

[c] Includes USMD, DO, Canadian, and Unknown Residents.

[d] Total Number of Residents – Number of Non-IMG Residents.

[e] Number of Non-IMG Residents/Total Number of Residents x 100.

Financing Medical Education

The five major sources of financial support for medical education are tuition and fees from medical school undergraduates, Medicare payments, excess revenues from the clinical activities of the faculty, state subsidies (which include allocations to schools, Medicaid funds, and tax-exempt status), and philanthropy.[ii] The amount of tuition paid by

[ii] Since the contributions of Medicaid, state grants, and philanthropy are not documented, they are not covered in this report.

undergraduate medical students depends primarily on the ownership status of their medical school (public vs. private) and, in public schools, whether students are residents of either the state in which the school is located or another state that has negotiated a reciprocity agreement to provide discounts to its students. In general, private medical schools charge higher tuition than public schools and public schools charge higher rates for nonresident than for resident students. For private medical schools, the median first-year tuition and fees increased from about $1,050 in 1960 to just under $28,000 in 2000. Over the same period, tuition and fees at public institutions increased from $830 to $24,245 for nonresident students and from $498 to $10,941 for resident students. Nationally, medical school revenues from tuition and fees grew from $28.1 million in 1960[6] to $1.48 billion in 1998.[7] The growth in medical school tuition and fees has caused substantial growth in medical school debt among graduating medical students, which now averages $70,926 per student (including the 17.4% of medical students who have no medical school debt).[8]

The federal government, through the Medicare program, is the single largest explicit supporter of graduate medical education expenses. These Medicare payments take the form of payments to teaching hospitals and other clinical facilities that train residents. Medicare funding of GME, which is linked to the provision of care to Medicare beneficiaries, has two parts, the Direct Medical Education payment (DME) and the Indirect Medical Education payment (IME). DME payments are meant to cover the direct costs of training residents at teaching facilities, including residents' salaries, fringe benefits, teachers' salaries, and overhead expenses. The DME payment, which varies significantly by institution, is based on the number of trainees in a hospital; the volume of Medicare patients seen in a hospital; and an estimated cost of medical education in 1984, adjusted for inflation, specific to each institution. In 2000 Medicare's estimated outlay for DME was $2.7 billion.[9]

The IME is an additional amount of money provided to cover certain clinical costs unique to teaching hospitals. Some (though not all) of these costs are related to the education of residents. For example, it has long been argued that residents provide more expensive care compared with fully trained doctors because residents may order more tests and provide more treatment as part of the learning process. Surgery may take longer and patient discharge may be delayed as a result of the teaching requirement. Faculty may see fewer patients because they have to pause during the day to instruct residents. In 2000, the IME subsidy was estimated at $5.1 billion.[10] In total, the Medicare program provided an estimated $7.8 billion in GME payments to AHCs in 2000.

The final major source of support for both UME and GME derives from the clinical activities of the faculty. Data on clinical subsidies of UME and GME are not routinely collected. In 1993, the latest year for which any data are available, approximately $2.4 billion from faculty practice plans was used to support academic activities. Of this amount, an estimated $1.3 billion ($702 million for UME and $594 million for GME) from faculty practice plans supported medical education activities at AHCs.[11] Updating these figures for inflation using the medical Consumer Price Index (CPI) suggests that in 2000 an estimated $1.75 billion in faculty practice plan revenues was devoted to medical education.

In addition to faculty practice plans, teaching hospitals provide another source of support for medical education in AHCs. Many AHC facilities make direct, unrestricted payments to medical schools to support the schools' academic missions. Presumably, some of those funds are used to support UME. The size of such payments nationally is unknown, but a study by the University Health System Consortium indicated that in one sample of medium-sized AHCs, net support to the medical school from the state, the university, and the clinical enterprise averaged $48.6 million per year in fund transfers (excluding central services not charged and salary pass backs).[12,13]

Academic Health Centers and Medical Education

All of the nation's medical students receive their training in AHCs. In addition, the Task Force has estimated that 40,000 residents, 40 percent of the total, receive graduate medical education from the 162 AHC hospitals with the largest and most prominent teaching programs.[iii] In addition to learning the formal undergraduate and graduate curricula that have been described, these students benefit from additional educational opportunities that are created by virtue of other activities the AHCs undertake.

The educational mission permeates the life of the AHC and apparently unrelated activities also play important supporting parts in the training of physicians. This integration of education into all of an AHC's missions—research, high technology and specialized services, and care of vulnerable populations—serves an important function in the educational process.

[iii] A special list of AHC hospitals with major GME responsibilities was constructed for this analysis; the hospitals were selected as follows. Using a list provided by the AAMC, the list included all integrated academic medical centers, defined as hospitals either under common ownership with a college of medicine or with the majority of medical school department chairmen serving as or appointing the hospital chiefs of service. If no AHC hospital was included in the AAMC list for a given medical school, we added hospitals having a major affiliation. If there was more than one hospital with a major affiliation for a given school, we selected the one with the most residents. To ensure that we captured AHC hospitals with major GME responsibilities, we also included the 100 hospitals nationally with the largest number of residents. This effort resulted in 162 hospitals.

Because of the constant changes in biology knowledge and the management of health care systems, a major challenge for the educational process is to prepare students for lifelong learning. The formal curricula of medical schools are dated almost as soon as physicians-in-training go through them. Physicians cannot hope to provide competent care to patients over a 40- to 50-year career unless they have the ability to update their skills. One way to help students with this challenge is to instruct them in the scientific method, so they can become critical consumers of new information as it is presented to them in the literature or from other available sources. Because 28 percent of the biomedical research performed in the U.S. is conducted at AHCs, such centers are uniquely suited to provide such instruction.[14] It is easy and natural for scientists to circulate between the laboratory and the clinical setting, and for curious students and residents to do the same. Through instruction by researchers and personal research experiences, medical students and residents have unique opportunities at AHCs to acquire critical skills and attitudes that will help them to grow as physicians throughout their careers.

Another educational opportunity offered by AHCs is exposure to high-technology medicine and specialized services. The Task Force on Academic Health Centers has documented the disproportionate role that AHCs play in providing highly specialized services to the American public.[15] Physicians who plan to specialize require deep and broad involvement in the provision of high technology and specialized services as part of their training, and physicians who never plan to provide such services can develop an understanding of specialty care from exposure to it. Because of their mission to provide such services, AHCs are able to offer students and residents a full range of educational experiences and provide training to physicians who plan to practice in a specialty environment.

A third way in which AHCs indirectly support medical education is through the disproportionate role they play in caring for the poor and uninsured.[16] This is especially true of AHCs affiliated with publicly owned clinical facilities. Such institutions attract a more diverse patient population, both ethnically and socioeconomically, than do non-AHC facilities. This creates an opportunity to expose physicians-in-training to the needs of such patients and the challenges of providing culturally competent care. Though much remains to be done to improve medical education with respect to cultural competency, AHCs constitute an important setting in which to accomplish this task.

Economists use the term "joint product" to describe something that is produced in inextricable combination with other products. That term seems accurately to describe the

education of physicians in academic health centers. AHCs train physicians as part of the process of conducting research and providing diverse services to diverse populations while they conduct research and clinical care as part of the process of training physicians. This nexus of activities makes them unique in the American health care system. While AHCs can be criticized for being slow to adapt certain aspects of their curricula, particularly at the GME level, to changes in the nature of health care delivery, the training model they use—combining education with research and a broad and diverse clinical experience—has a compelling logic during this time of scientific and structural upheaval in the U.S. health care system.

It should also be noted that research-oriented AHCs are not the only institutions where physicians can be successfully trained. Community-based medical schools, which conduct little research and are affiliated with community hospitals, and "freestanding" residencies, which are unaffiliated with medical schools, also play a major role in the training process, especially for primary care physicians.

The Public and Policymakers Have a Stake in the Educational Mission of AHCs

The Task Force's interest in the educational mission of AHCs and its decision to publish this report are not based solely on the observations that medical education is important and that AHCs play a central role in that process. The Task Force believes that the American public, public policymakers, and private health care managers have a pressing stake in the health of our nation's medical education enterprise, and thus in the ability of AHCs to discharge their educational mission. As suggested above, the quality of care that the public receives is determined to some extent by the quality of medical education that students and residents receive. Thus, medical education can be thought of as providing a form of consumer protection. Economists have long accepted that large asymmetries of information characterize relationships between physicians and patients, and that these disparities make it difficult for patients to judge the competence of doctors and make informed purchase decisions.[iv] Though it has been suggested that the information revolution may overcome such asymmetries, our society has not reached that point and

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[iv] A number of policy writers make the claim that medical education is a public good, but this position is controversial (J. P. Newhouse and G. R. Wilensky, "Paying for Graduate Medical Education: The Debate Goes On," *Health Affairs* 20 [March/April 2001]: 136–47). Most economists view medical education as an investment in human capital rather than a public good. First, the benefits of future income accrue largely to the individual physician. Second, the provision of health care fails to meet the test of being nonexclusive and nonrival, because consumption of medical care accrues largely to the recipient of that care. However, to the extent that medical care is a private good with certain externalities (i.e., benefits such as public health that apply to the general population), it may be deserving of public subsidy to encourage an optimal allocation of resources. (A. L. Gbadebo and U. E. Reinhardt, "Economists on Academic Medicine: Elephants in a Porcelain Shop?" *Health Affairs* 20 [March/April 2001]: 148–52).

may never do so.[17] It is also quite clear that certain societal groups (for example, the functionally illiterate and the cognitively impaired) will remain unable to assess accurately the quality of their physicians.[18] The resulting need to protect patients and to assure that society's health care goals are met justifies a governmental role in regulating the quality of the physician workforce.

This governmental role has taken at least two forms. First, state governments license all physicians, and as part of that process, require that they graduate from medical school and complete at least one year of residency. Second, the government indirectly supports the private system of accreditation represented by the LCME and ACGME by requiring that physicians must graduate from an accredited school and an accredited training program to be licensed. At both state and federal levels, the government further supports this private sector process of quality assurance by conditioning receipt of government payments (for example, grants to subsidize particular programs and Medicare GME support) on accreditation.

The process of direct and indirect regulation of the medical education process helps to assure that physicians receive the UME and GME they need to perform competently. The regulatory process also imposes costs on private actors and particularly on clinical teaching institutions, which are responsible for GME and the clinical years of UME. The sources of those added costs were described in the section on financing medical education. Some economists argue on theoretical grounds that these added costs are borne completely by trainees in the form of reduced compensation for their services and that this is a reasonable way to pay for medical education.[19] However, this argument has not persuaded all economists.[20] The only empiric evidence available on this topic suggests that involvement in education explains a significant portion of the added costs of AHCs, even after controlling for case mix and other unique mission-related expenses (see Finding 5). Given the controversy over this question, the strong intuitive sense among AHC leaders that education imposes extra costs, and the available empiric evidence, it would seem premature to conclude that education does not contribute to the higher cost of providing clinical care at AHCs compared with community hospitals.

Because the government has a vital interest in the quality of medical education, it also has an interest in assuring that health care institutions are able to recover their reasonable educational costs. Historically, AHCs have recovered those costs by charging higher prices than their nonacademic competitors to both private and governmental purchasers of services. When the Medicare program instituted a uniform pricing system

for hospital discharges under the prospective payment or DRG system in 1983, the extra costs associated with medical education (and other AHC missions) were acknowledged with supplemental GME payments to teaching hospitals. However, AHCs experienced greater difficulty recovering their extra educational costs from private payers during the 1990s, as competition and managed care reduced the prices that AHCs could charge. This change in private health care markets has created stresses on the educational mission of AHCs that should concern public policymakers.

For their part, managers of private health care institutions also have a pressing stake in the educational mission of AHCs. Physicians remain the most important and powerful element of the modern health care delivery system. Their decisions control the allocation of most medical resources. Without active or tacit physician support, hospitals, managed care organizations, nursing homes, or medical groups cannot achieve organizational objectives of quality improvement, cost reduction, or increased access. Many of the critical attitudes and behaviors of physicians are imprinted during their medical training. When those attitudes and behaviors interfere with needed changes, the result is frustrating for health care managers and potentially devastating to the fortunes of their organizations.

It should be clear, therefore, that the manner in which AHCs perform their educational missions is a matter of vital and legitimate interest to the public at large and to both the public and private sectors. In subsequent sections, the Task Force characterizes the current state of the educational mission and makes recommendations for improvement.

III. FINDINGS: CHALLENGES TO THE EDUCATIONAL MISSIONS OF AHCS

Finding 1. The scientific basis of medical practice expands exponentially.

An enormous expansion in the knowledge relevant to medical practice constitutes a fundamental challenge to the educational mission of AHCs. At the undergraduate level, the time devoted to UME has remained unchanged (four years) for almost 100 years. Yet the amount of knowledge that must be conveyed during that time has grown immensely. The most commonly cited evidence of this development is the need to acquaint medical students with the genetic basis of health and disease, as revealed by the Human Genome Project and other research. Twenty years ago, medical school genetics consisted of understanding Mendel's simple rules for the inheritance of the dominant and recessive genes that were known at the time to be associated with a few rare diseases. Now, many more genes have been implicated in causing diseases, such as breast, colon, and ovarian cancers, juvenile diabetes, and certain types of chronic lung disease. In addition to understanding the structure of the human genome, aspiring physicians must master the processes that govern its expression, the ways in which those processes malfunction, and the chain of causation that leads to disease.

However, genomics is only one of several new domains of scientific knowledge that challenge the undergraduate education of physicians. The new field of proteomics covers the structure and function of proteins, particularly the ways in which proteins interact with one another in health and disease. Neuroscience is providing unparalleled new insights into the human mind and nervous system. Medicine's understanding of immunology and the inflammatory process is vastly greater than it was just a few decades ago. Epidemiology is providing understanding of the causes of disease long before underlying biochemical and genetic mechanisms are unearthed. The medical decision sciences can help physicians make more appropriate and cost-effective use of new and existing medical treatments. All these areas of fundamental new knowledge are vital to understanding new diagnostic and therapeutic agents and approaches in the 21st century. And with a proposed doubling of the budget of the National Institutes of Health, medical students and their faculty can only expect the rate of increase in new knowledge to continue to grow.

At the graduate medical education level, the same phenomenon is occurring. Applications of new basic sciences to clinical practice are growing exponentially. A vast

new drug armamentarium is now available for the treatment of such illnesses as high blood pressure, congestive heart failure, depression, schizophrenia, seizure disorders, cardiovascular disease, and migraine headache. New imaging technologies and minimally invasive surgical techniques now enable physicians to diagnose and treat a vast array of diseases such as cancer, stroke, and infection more quickly and with less trauma than in the past.

Learning the uses and capabilities of these new tools is essential to preparing young physicians for practice. But, at the same time, graduate medical education must continue to teach older methods that remain valid for the treatment of these same diseases, such as the special diets required for patients with congestive heart failure or diabetes; the use of common antibiotics for community acquired pneumonia or uncomplicated cellulitis; how to repair a simple hernia or remove an appendix; and how to make sure individual patients feel that their physician has listened to and attended to their particular complaints.

Finding 2. The nature and demands of medical practice are changing.

The end of the twentieth century coincided with a sea change in how medicine is organized and financed, and in society's expectations of practicing physicians. Today physicians must be prepared to practice in multiple locations and settings, to adapt to rapid changes in the management and structure of health care institutions, and to be held accountable in new and sometimes unsettling ways for their own performance and that of the organizations in which they function.

More physicians than ever before now practice in groups (three or more physicians) as opposed to solo practice,[21] and increasing numbers of graduating medical students now expect to be employed by organizations, such as group practices, hospitals, or integrated delivery systems rather than in a solo practice.[22] Physicians are moving into organized settings for a number of reasons. In the managed care era, physicians find safety in numbers when negotiating prices with third-party payers. The information revolution also makes organizations attractive, because they can help physicians with the capital costs and technical challenges of building an electronic infrastructure that provides computerized decision support and (eventually) an electronic medical record. Finally, both male and female physicians are increasingly seeking ways to better balance the demands of work and family, and flexible hours and cross-coverage are easier to arrange in groups than in solo practice.

Another change in practice settings involves the massive shift of care from inpatient to outpatient and ambulatory locations. New technologies have allowed many procedures to be performed less invasively and more safely, allowing more care to be provided outside the hospital. To save money (and to reduce exposure to iatrogenic events that occur during inpatient stays), hospitals have shortened lengths of stay dramatically. It has become routine for patients undergoing major surgical procedures to arrive at the hospital on the day of their procedure. Postoperative lengths of stay are much shorter. Twenty years ago, a patient experiencing a heart attack would almost invariably have spent a week in the hospital. Today, he may go home in a day or two after treatment by angioplasty to open the offending coronary artery. The same is true of medical conditions (that is, those treated without surgery). The consequence for medical practice is that increasingly complex care is rendered in outpatient settings, requiring more teamwork and coordination among specialists, nurses who visit patients at home, and families.

Besides changes in their practice settings, physicians must cope with other systemic developments. Insurance companies are continually experimenting with new methods of paying for care, hoping to reduce costs and/or improve the quality of care. In the last decade, fee-for-service payers have implemented resource-based relative value systems, and managed care companies have introduced various forms of capitation. New changes under consideration include the use of partial capitation and episode treatment groups (in which a single payment is made for treating an episode of illness that may include multiple services). The Medicare program is developing a new prospective payment system for outpatient physician care. Physician payments are sometimes tied to incentives that encourage or reward certain practices: reduced utilization, increased patient satisfaction, and the achievement of quality goals, such as delivery of preventive services.

The incorporation of quality goals into payment systems reflects still another development in the nature of practice: the manner in which physicians are increasingly held accountable to payers, organizations, and the public at large for their clinical performance. One example of this trend is the publication in New York State of physician-specific data on mortality from coronary artery bypass.[23] In Massachusetts, Tufts Associated Health Plan rates primary care physicians based on patient satisfaction data and on the proportion of eligible patients who receive mammograms and Pap smears. More common than physician-specific ratings are measurements of the performance of organizations, such as hospitals and health plans, by private and public purchasers of service, such as the Pacific Business Group on Health and the National Commission on Quality Assurance. One aspect of organizational performance that recently has received a

high level of scrutiny is the frequency of medical errors. A new coalition of large employers, called the Leapfrog Group, has issued a set of performance standards to avert medical errors. Since the behavior of physicians is critical to the performance of health care organizations, hospitals and plans respond with efforts to motivate physicians to cooperate in quality improvement, error reduction, and cost reduction efforts. Indeed, the success of these facilities and the future of our health care system is more and more dependent on the ability and willingness of physicians to engage in such projects.

Predicting where all these changes will lead is difficult, but one thing is clear: preparing physicians to be productive and constructive members of an increasingly complex, dynamic, and accountable health care system is now an essential task for medical education at both the undergraduate and graduate levels. To meet this challenge, AHCs must convey both concrete skills and an appropriate set of expectations and attitudes. Among the concrete skills that future physicians will need are an ability to work in teams with other physicians and nonphysician health professionals; an understanding of how quality of care is defined, measured, and improved; familiarity with certain basic economic constructs such as cost-effectiveness and cost-benefit analysis; and some familiarity with the way health care organizations are managed and the behaviors that are best suited to achieving desired goals within such organizations. It will not be sufficient to convey such skills in formal didactic sessions. Similar to the other practical lessons of medical education, students and residents must be exposed to these new skills during the daily care of patients. Only if respected faculty role models demonstrate these new capabilities will students and residents truly internalize them. The involvement of faculty in this way will be essential to assuring that young physicians leave their training prepared psychologically as well as cognitively for a world of constant change and continuing uncertainty.

Finding 3. Methods of instruction in medical education evolve at a rapid pace. Innovations can be costly to implement and to sustain over time.

Changes in the way medicine is taught constitute another challenge to the educational mission of AHCs. These changes stem from advances in pedagogic theory and the availability of new educational technologies.

Traditional medical education often emphasized passive learning during the pre-clinical years of medical school. Consistent with the recommendations of Abraham Flexner's 1910 report to the Carnegie Foundation,[24] medical school students traditionally

sat through hours of lectures on basic sciences and discussion took place in large groups, sometimes with the whole class present. Advances in our understanding of learning processes now suggest that such techniques may be suboptimal. New approaches build on concepts of adult education. They rely on situational learning and are active, self-directed, student-centered, and experiential.[25] During the 1980s, the AAMC distributed its "GPEP Report" (Report on the General Professional Education of the Physician),[26] and Harvard University subsequently issued a report on medical education that emphasized small group study.[27] Subsequent reforms in medical education have integrated course work across academic departments, and aim to combine instruction in basic science with introduction to clinical topics. By facilitating active learning, new educational approaches seek to prepare students for lifelong learning. By crossing disciplines, they endeavor to prepare students for a world where cross-disciplinary teamwork is increasingly necessary. By exposing students to clinical environments early in their training, new approaches aim to integrate basic science into clinical thinking more effectively and to build confidence that will facilitate more intensive clinical learning at a later date.

One approach that attempts to encapsulate a number of these pedagogic insights is Problem-Based Learning (PBL).[28,29,30,31,32] Used primarily in the first two years of medical school, PBL works through problem-solving exercises conducted in small groups of students under the supervision of one or two faculty members. Early efforts at PBL occurred at McMaster University[33] and the University of New Mexico.[34] In 1985, it was implemented at Harvard Medical School and received widespread acceptance. Although clearly attractive in many respects, one of the limitations of PBL in small groups is its expense. Under the old system, one faculty member could teach physiology or anatomy to a class of 150 medical students. Using PBL, those same students may learn anatomy and physiology in 20 groups with two professors per group. Obviously, the number of full-time equivalent faculty involved in education is far larger under the new system; further, the faculty must acquire teaching skills appropriate to this new environment. This often involves costly instruction in didactic methods.

Advances in computer-based instructional technologies have also created new opportunities and challenges in medical education. Examples of these advances follow.

- *Simulators.* A number of companies now produce medical simulators based on a dummy or mannequin that allows students and residents to practice handling a variety of medical problems.[35,36,37] The most advanced versions are fully programmable and able to replicate many features of human physiology and

pharmacology.[v] In addition to mannequins, computer-based simulations of biological processes are available for teaching the basic science curricula.

- *Standardized patients.* This method uses an actor who plays the role of a patient with whom students or residents interact. Although standardized patients can be used in low-technology settings in theory, in practice they often take advantage of sophisticated videotaping and feedback equipment that allow students, faculty, and actor/patients to review and critique student performance. Standardized patients are helpful in teaching such clinical skills as history taking and physical examination. They can also be used to evaluate students' and residents' mastery of essential clinical skills at the completion of undergraduate clerkships or graduate residencies.

- *Knowledge management technologies.* This method uses Internet-based and other computer technologies to establish an "e-curriculum." The idea behind knowledge management is to replace the traditional reliance on large lecture classes with other methods of communicating information;[38] distance learning is a related idea. Premier lecturers can share their knowledge with learners at several medical schools, rather than being limited to the school where they are on the faculty. For optimal implementation of knowledge management techniques, medical schools may need to form consortia or regional centers.

The implementation of these new approaches to medical education has associated costs. However, no systematic data on these expenses are available. To gain a better appreciation of these costs, the Task Force staff interviewed a convenience sample of medical educators around the country. The list of educators was developed with input from officials of the AAMC and supplemented with contacts suggested by interviewees. Unfortunately, none of the officials or schools contacted could provide accurate information on the costs associated specifically with investments in new medical education techniques. Schools are clearly not accustomed to accounting for the costs of their missions, despite recent efforts to institute mission-based management in some AHCs (see Finding 13); however, the following anecdotal information on costs was obtained.

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[v] Among the most common simulation programs/devices are the Visible Human (a complete, anatomically detailed, three-dimensional sectional representation of the normal male and female human bodies) that was created by the National Library of Medicine, the Virtual Patient Project developed at Harvard, the METI human patient simulator, and "Harvey," the famous manikin that was developed at the University of Miami and is able to re-create many of the physical findings of the cardiology examination, including palpation, auscultation, and electrocardiography.

- *Faculty time.* Reliance on PBL, small groups, and tutorials results in much heavier use of faculty than traditional large-group instruction. The New Pathways program at Harvard Medical School involves large numbers of faculty as tutors, lab teachers, seminar organizers, and clinical clerkship instructors.[39] At Cornell, curriculum reform over the last few years has led to a 300 percent increase in "clinical faculty commitment" (a rough measure of teaching time) required to teach the years 1 and 2 courses.[40] Total instructional hours increased from about 3,000 a year to more than 12,000. For the years 3 and 4 curriculum, faculty commitment increased from 14,000 to 16,500 hours.

- *Renovation of existing space.* Problem-based learning also may have associated capital costs. The University of Rochester has renovated 12 rooms to accommodate PBL. Each room includes laptop hook-ups for Internet connectivity and a physician examination room. The physical examination rooms, which will also be used with standardized patients, have video cameras. The university has also redesigned a lecture hall to accommodate interactive teaching.

- *Purchase of simulators.* The costs of purchasing mannequins ranges from about $30,000 to close to $200,000; however, these costs are small compared with the cost of building facilities and ongoing operating costs, which require technicians and faculty (see Table 3).

- *Professional development of faculty.* The phrase "We tend to teach the way we were taught" is common around medical school campuses. However, medical school faculty members now face the need to add new methods and ideas to their teaching practices.[41] These include developing leadership skills (for course directors) and learning to structure Internet-based courses, teach in small groups, write and use case studies, and provide effective mentoring. It is important to note time spent learning new educational methods involves lost clinical income and direct educational expenses for schools and their faculty. In some schools, individual faculty members or their departments must absorb these costs. Others fund tuition costs out of the benefits package and cover faculty salary from clinical income. The Mayo Foundation provides through a Clinician Educator Award Program a total of $100,000 in expenses and up to 10 percent protected time for faculty members engaged in course development.

- *Organization and scheduling.* The increased use of ambulatory education, although necessary to prepare students and residents for changed practice patterns, may be inherently less efficient than the old model of hospital-based learning. Ambulatory education requires the recruitment of an extensive network of community-based physicians. Even when this faculty does not require compensation, managing them creates additional overhead for medical school deans and residency directors. Further, it may be necessary to offer some compensation to this type of faculty for the loss of clinical income associated with working students and less-experienced residents. AHCs have just begun to appreciate the hidden costs that may be associated with a decentralized education experience. For example, assuring that students and residents have access to reference material when based off-campus in a community physician's office may require equipping them with a laptop computer and Internet connections. New course offerings (including standardized patients and simulation) may be necessary to assure that all students have exposure to a basic minimum of clinical material.

- *Departments of Informatics and Educational Technology.* The cost of equipment is not necessarily the major expense in running an "e-curriculum." Knowledge management requires the efforts of medical school faculty who are versed in these technologies. There are two components to the costs of these technologies: (1) creating the repository of information and (2) organizing and managing the information, which requires ongoing maintenance. Some schools now recognize the need for a dedicated staff and the support systems they need to maintain these functions. For example, Harvard Medical School has established a newly created office run by an Associate Dean for Educational Technology. To support the office's activities, Harvard pays for an educational technology support staff with four to six full-time employees and for faculty who serve as content advisers.[42]

As another approach to understanding the potential costs of reforms in medical education, we identified a group of institutions that have constructed comprehensive new education technology centers. These medical schools are considered by many to be leaders in the implementation of new educational technology. Table 3 provides estimates of the costs they have incurred in establishing these new centers, and the sources of required funding. These costs vary wildly, because some schools have renovated existing space while others have constructed new buildings. The sources of funding for these ventures also varies and includes government allocations, gifts or donations, foundation grants, and revenues from use of the facilities.

Table 3
Samples of Costs: AHC Medical Education Technology Centers

Academic Health Center	Construction and Renovation Costs[a]	Annual Operating Costs	Source of Funds[b]
The Uniformed Services University National Capitol Area Medical Simulation Center	$4,500,000	$1,200,000	Government allocation
Cornell University Weill Education Center	$10,000,000	NA	Gift/donation
Northwestern University Clinical Education and Evaluation Center (CEEC)	$264,000 (renovation only)	$230,000	Foundation grants
Johns Hopkins Clinical Education Center	NA	$180,000[c]	Revenues from use
Harvard University Center for Medical Simulation (CMS)	$250,000 (renovation only)	$800,000	Revenues from use[d]
Mayo Global Technology Center (Planned)	$30,000,000	NA	Foundation
Mayo Simulation Center (Planned)	$12,000,000	NA	Foundation

[a] Includes construction, renovation, and/or design.

[b] Changes in medical technology and the nature of the expertise needed to train students in the proper application of diagnostic and therapeutic devices make it necessary for some training costs to be provided by industry. Such initiatives, when they adhere scrupulously to educational content over product promotion, may serve as an invaluable source of support for the educational mission of AHCs.

[c] Against annual revenues of $200,000.

[d] $4,500 a day.

It should be noted that reforms in medical education also can create savings, though these are no more quantifiable than costs at the current time. The use of simulators is a case in point. When fully implemented, a program using simulated patients will most likely require less faculty time for instruction. In addition, simulators may allow for additional savings due to the closing or downsizing of teaching labs in courses such as anatomy, biochemistry, physiology, and some neurosciences. Students may be able to reduce time spent in clinical clerkships, or use their time more efficiently because basic procedures have been learned on simulators. Similarly, patients may benefit because simulators could reduce the need for students to practice medical procedures on humans. These centers also have the potential to create savings for the medical services system, because theoretically they should lead to fewer errors by residents. Possibilities to generate revenue also exist, as in the case of Johns Hopkins's standardized patient facility, although these opportunities may diminish as more medical schools obtain their own equipment and facilities.

Finding 4. The clinical environment within AHCs is widely perceived as unreceptive to medical education.

The American system of medical education places heavy emphasis on both students and residents participating in the delivery of care. This philosophy requires that students and residents encounter sufficient numbers of patients with a broad array of illnesses and receive instruction from a committed and capable clinical faculty. However, because of cost containment measures and the resulting pressure on physicians to be more clinically productive, the clinical environment seems to have become less conducive to medical education. Based on case studies and other evidence, the Task Force has identified at least three developments that present formidable challenges to traditional educational methods in AHCs.

- *Decreased use of hospitals:* From 1982 to 1997, average lengths of stay for Medicare patients dropped 40 percent, from 10.2 to 6.3 days.[43] Similar trends have affected nonelderly patients. At the same time, occupancy rates and the total number of hospital beds have been falling.[44] What this means in practice is that patients routinely receive pre-operative assessments and work-ups before being admitted and receive much of their follow-up care in ambulatory settings after they are discharged. A common complaint among students, residents, and faculty is that lengths of stay are so short that trainees do not have sufficient time to learn from each case. In addition, very short hospital stays mean that proportionately more time is spent in fulfilling administrative services associated with admission and discharge, leaving less time to visit with patients while they are undergoing treatment. In the 1998 Commonwealth Fund Survey of Residents conducted by research staff at the MGH Institute for Health Policy, 84 percent of respondents believed that incoming residents would face the same or higher levels of "scutwork" associated with their hospital experience compared to current levels, and this percentage was significantly higher in areas with very high managed care penetration.[45] The general feeling was that the educational content of the training experience was giving way to overarching pressures to hurry the patient through the stay.

- *Increasing demands for productivity.* During the mid and late 1990s, price competition among providers added substantially to pressures on physicians to increase their clinical productivity. AHCs have had to conform to these pressures, and this has created considerable pressures on clinical faculty who are trying to maintain their

teaching commitments while also increasing the number and reducing the duration of visits and procedures. As patient throughput increases in faculty practices, opportunities for faculty to engage in meaningful teaching of medical students and residents decrease. The result can be that faculty satisfaction declines as faculty members feel they are unable to perform effectively as either teachers or practitioners. In a 1996 survey of medical school faculty, the MGH Institute of Health Policy found that clinical faculty were the least satisfied group among faculty, and that levels of satisfaction tended to decrease as clinical workloads increased. Least satisfied of all were clinical faculty in markets with high managed care penetration.[46] In a national survey of medical schools, nearly three out of five faculty members, residency-training directors, and department chairs believed that managed care had reduced the time they had available for teaching.[47]

- *Increasing demand for outpatient clinical preceptors in the face of decreasing availability.* As documented elsewhere in this report, the site of patient care is shifting toward ambulatory settings, and this in turn requires a change in the setting and content of medical education. Such a shift requires the recruitment of a whole new cadre of educators—community clinical preceptors. These clinician educators are most often volunteers. Some medical schools offer inducements to these volunteers, such as free newsletters or free or reduced registration fees for their CME courses. Task Force case studies have found widespread concern among medical educators over the difficulty of recruiting and retaining high-quality community preceptors who provide intellectually stimulating learning environments. In the 1999–2000 LCME survey, 83 percent of deans reported they had experienced difficulty with recruiting/retaining volunteer faculty members because increased pressure for efficiency in clinical practice was making community physicians less willing to participate in clinical teaching.[48]

Finding 5. Pressures on the clinical enterprise undermine financial support for medical education.

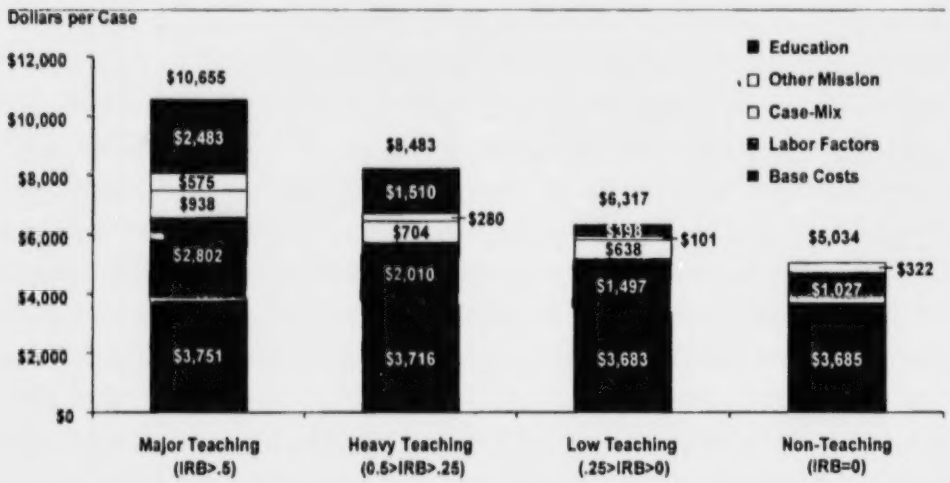
Relationship Between Medical Education and the Costs of Care in AHCs

With support from the Commonwealth Fund, Lewin Associates explored the relationship between the cost of care and the educational activities of AHCs. Their work is unique in two ways. First, it uses data for all patients seen at AHCs, not just Medicare patients, as has been the case in most studies of this issue. Second, their study attempts to control for other activities and characteristics, such as involvement in clinical research, maintenance of

standby capacity for high technology services, and patient case mix, that may be confounded with education as a source of the added clinical expenses of AHCs. Newhouse and Wilensky[49] have argued that these other activities, not the education of residents and students, actually account for the extra expenses of AHCs. Education costs, they have argued, are borne by physicians-in-training in the form of reduced compensation for their work.

The results, by level of teaching activity, are shown in Figure 1. In 1995–96 there was a roughly twofold difference in average cost per case between nonteaching hospitals ($5,034) and hospitals with the greatest intensity of teaching ($10,655).

Figure 1
Distribution of Costs Due to Mission-Related Activities by Type of Institution, 1998



Source: Georgetown University analysis of data in Coleman et al., Estimating Provider Training, Standby Capacity, and Clinical Research Costs Using Regression Analysis. Lewin Associates, 1999.

The regression models used by the Lewin Group identify significant, positive relationships between overall cost per case in teaching hospitals and the intensity of teaching within institutions, as measured by the ratio of interns and residents to beds. This is true even after inserting variables that attempt to capture the influence of an AHC's participation in clinical research, provision of rare and high technology services, and differing case mix. Although these confounding variables add to the costs of teaching hospitals—in the case of major teaching hospitals, about $938 per discharge for case mix and $575 for research and specialized care—the measure of educational involvement remains a significant factor, adding $2,802 per case. The Lewin study does not prove that

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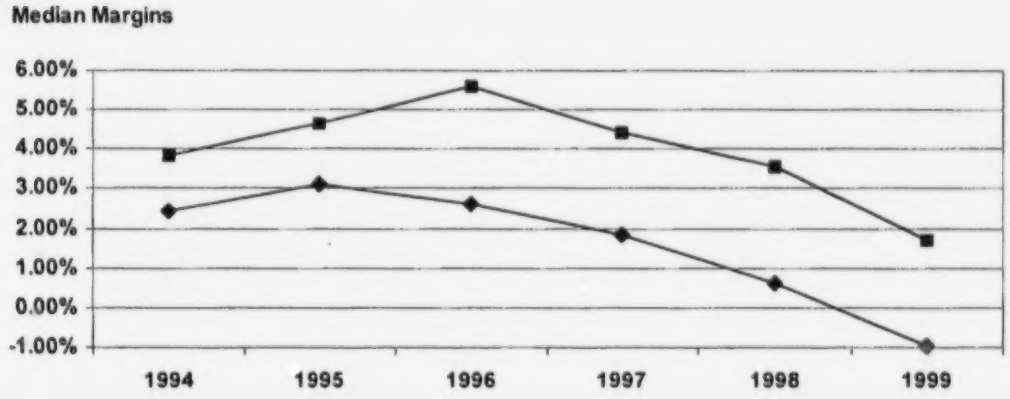
involvement in education is responsible for all $2,802 in extra costs associated with the institutional review board variable, which could be capturing the influence of other, unmeasured differences between teaching hospitals and nonteaching institutions (e.g., quality of care). However, this study does make the point that the best available data continue to support empirically the opinion of many AHC officials that teaching adds to the costs of patient care, and that those costs are not fully offset by lower labor costs through reduced payments to residents.

Another source of data on the extra cost of teaching comes from surveys of faculty group practice plans and analyses of the flow of funds within AHCs. As noted previously, faculty group practice plans are thought to contribute, on average, 28 percent of their revenues to the academic missions of medical schools, which include teaching.[50] Teaching hospitals affiliated with medical schools also frequently make contributions from net revenues to their academic affiliates. These payments constitute a direct subsidy of educational missions. The higher costs of care in AHCs reflect these direct contributions as well as other, hidden subsidies of the types mentioned above: reductions in faculty productivity associated with teaching, longer lengths of stay, the ordering of more tests and procedures, and so on.

Financial Status of Teaching Hospitals

As mentioned above, UME and GME are financed through a complex web of funds from tuition and fees, clinical subsidies, direct state and federal payments (Medicare and Medicaid payments and tax exemptions) and philanthropy. However, concern has arisen about the ability of AHCs to continue to finance their teaching missions through this patchwork of traditional sources. At most risk is the use of clinical cross-subsidies generated within AHCs themselves. According to data collected by the Lewin Group, margins among AHC hospitals deteriorated in the late 1990s. Figure 2 shows the aggregate total (upper line) and operating (lower line) margins for AHC hospitals using data from the AHA Annual Survey. The analysis includes hospitals identified by the AAMC as integrated teaching hospitals. The trend lines show that the financial condition of this group of hospitals improved somewhat in the middle 1990s, but that their financial condition started to deteriorate in 1997 and continued in steep decline in 1998 and 1999.

Figure 2
Trends in Aggregate Margins for AHC Hospitals, 1994–1999



Source: Lewin Group analysis of AHA Annual Survey Data, to be published in The Commonwealth Fund, "Financial Performance of Academic Health Centers: 1994 to 1999," Final Report, forthcoming.

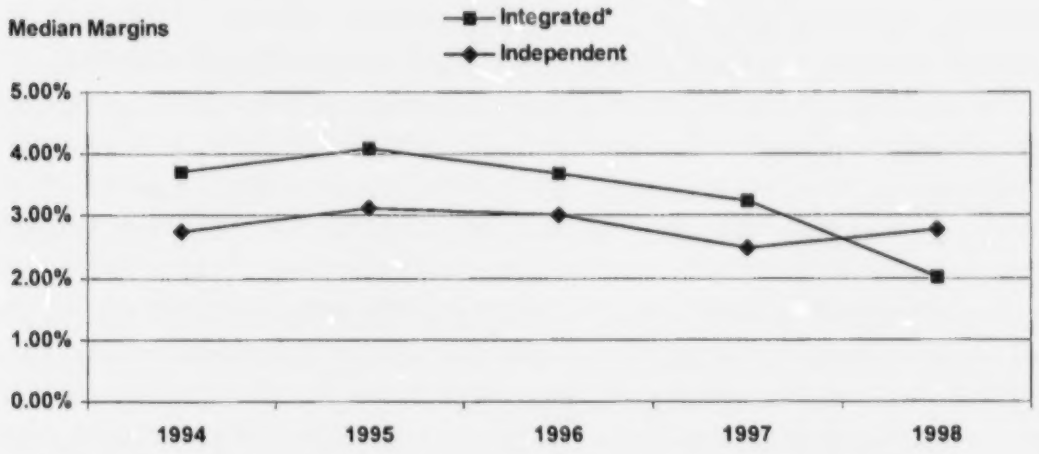
Figure 3 shows five-year trends in operating margins for two subgroups of COTH hospitals (members of the Council of Teaching Hospitals): major teaching hospitals that are highly integrated with medical schools and those that have independent relationships with medical schools.[51] Highly integrated major teaching hospitals are owned by the same entity as a medical school, or have the same individuals providing leadership in clinical and academic departments. Independent hospitals do not have this level of integration with a medical school, but have an affiliation agreement with a medical school for educational and other activities. Operating margins for both subgroups have declined since 1996, but the decline for integrated major teaching hospitals has been more severe. Operating margins for integrated major teaching hospitals were higher than those for independent major teaching hospitals until 1998, when the two reversed positions. The decline for both groups accelerated from 1998 to 1999.

The sources and amounts of funding may differ significantly between public and private AHCs. Figure 4 illustrates trends in median operating margins by ownership status. For public hospitals, the median operating margin declined from 1.25 percent in 1994 to −1.87 percent in 1999. Private COTH hospitals experienced a similar decline (2.80% in 1994 to 0.19% in 1999).

It should be noted that the margins of hospitals generally—and AHC hospitals in particular—have turned around in 2000, and net revenues may be increasing. The

Medicare Payment Advisory Commission has issued a report to this effect, and it accords with anecdotal information received by the Task Force. If true, this turnaround is welcome news from the standpoint of sustaining the teaching mission of AHCs. However, some AHCs may have sustained blows during the 1990s that will be difficult to overcome. Institutions such as the University of Pennsylvania Hospital; the University of Minnesota Hospital; Georgetown University Medical Center; the Beth Israel Deaconess Hospital in Boston; the Stanford University Hospital; and the University of California, San Francisco, experienced substantial losses during the late 1990s that have depleted reserves and left them with a high level of debt. Such financial reversals will reduce for some years to come the capacity of these institutions to invest in infrastructure, including information systems that contribute materially to the education of students and residents. Faced with these capital deficiencies, some AHCs have sold their clinical facilities to for-profit and nonprofit hospital chains. The long-term implications of such moves for the educational missions of AHCs remain uncertain.

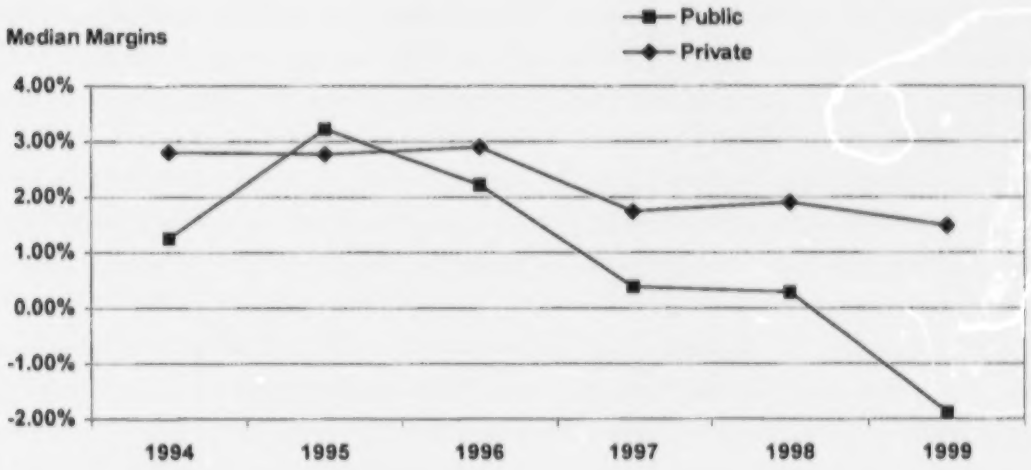
Figure 3
Median Operating Margins in COTH Hospitals, Fiscal Years 1994–1998



* Integrated AHCs are those that are: (1) COTH members; and (2) under common ownership with a school of medicine, or are freestanding but the majority of the hospital chiefs of service also serve as department chairs in the affiliated medical school.

Source: CAMCAM Fact Sheet, available online at http://www.aamc.org.

Figure 4
Median Operating Margins in Public and Private COTH Hospitals, Fiscal Years 1994–1999



Source: Lewin Group analysis of AHA survey data.

Finding 6. The medical education activities of faculty are valued less than research and patient care at AHCs.

Forty years ago, one could say with confidence that the core activity of U.S. medical schools was the education of medical students. That situation has very likely changed. During a period of unprecedented growth in clinical income and an explosion in biomedical research, the education of medical students—to some observers—has become "no more than a by-product of what academic medical centers are [now] doing."[52] The ascendancy of research and the dependence on income from clinical activities have contributed to what Ludmerer describes as "the devaluation of teaching."[53] As evidence, he notes that the day-to-day responsibility for preclinical educational curricula, once the purview of deans or department chairs, is now often relegated to associate or assistant deans of medical schools.

For much of the last century, the ideal of the "triple-threat" faculty member—proficient simultaneously in teaching, research, and clinical care—dominated the academic culture in medical schools. In practical terms, this ideal is no longer attainable (if it ever was), given the increased demands associated with excellence in any of these three areas. A recent report based on extensive case studies of AHCs in the late 1990s notes that

"productivity in either research or service now demands that the majority of one's time be spent doing one or the other."[54]

The new prototype of a faculty member is a star researcher or, less commonly, a world-class clinical specialist. Tenure committees place most emphasis on research productivity in their deliberations, but will also consider excellence in clinical service. The message regarding education has been clear: it is less important than research and patient care. In part because of the perceived lack of academic reward associated with education, deans report increased difficulty recruiting clinical faculty to teach preclinical courses.[55]

Although much of the perception of the lower value of teaching among the AHC missions is based on case studies and anecdotes, there is some empiric evidence. In a study of the academic promotion process at Johns Hopkins University School of Medicine, researchers surveyed all faculty members who were considered for promotion to associate or full professor from 1980 to 1985. Faculty members who resigned from the university during the study period also were surveyed. The rate of promotion from assistant to associate professor was significantly lower for clinical educators than for clinical or basic science researchers.[56] Furthermore, respondents ranked publications as the most important criteria in consideration for promotion, while teaching was considered the least important.

Additional evidence can be found by examining the criteria and methods that medical schools use for promoting clinical educators—defined as faculty who spend the majority of their time in clinical care and medical education activities and who engage in little or no research. A 1996 survey of chairpersons of all medical school promotion committees in the United States and Canada found that 55 percent of schools did not have a separate track for clinician educators.[57] Further, almost half of all medical schools (48%) did not have specific criteria for the promotion of clinician educators. Finally, this study suggested that in the area of scholarship many medical schools devote relatively little attention to the evaluation of clinical educator's abilities to develop educational materials.

How AHCs Are Responding to Challenges

Academic health centers in the United States are making a major effort to respond to the challenges facing their educational missions. Nevertheless, progress remains slow and uneven in some areas, and major opportunities for improvement exist.

Finding 7. AHCs are undertaking reforms to prepare physicians better for the demands of modern medical practice, such as practice in ambulatory and community-based settings.

Reforms in Undergraduate Medical Education

A number of national medical education groups have noted the need for reforms in undergraduate medical education to prepare students better for the changing health care environment.[58,59,60,61] In 1996 the AAMC embarked on the Medical School Objectives Project, an initiative that was designed to "stimulate changes in medical education to create a better alignment of the educational content and goals with evolving...practice patterns."[62] These reforms center on improvements in training in one or more of the following curriculum-content areas (CCAs) oriented toward modern medical practice: primary care, ambulatory care, health promotion/disease prevention, teamwork, medical care cost control, and providing cost-effective care.[63,64,65,66,67]

There is ample evidence that ambulatory and community-based education have taken hold in medical education. From 1993 to 1995, the number of schools requiring an ambulatory experience in the first UME year increased by over 50 percent (from 22% to 35%).[68] The most recent data available on the percentage of all medical school graduates in 1999–2000 who participated in ambulatory educational experiences as part of a clinical clerkship is provided in Table 4. In addition to clerkships, many medical students also have the opportunity to spend time with community-based physicians in ambulatory settings during other course work.[69]

Table 4
Percentage of Graduating Medical Students Who Participated in Required Ambulatory-Based Clerkships in 2000

Required Ambulatory Activity	Percentage Participating*
Primary Care Clerkship (interdisciplinary)	57.8%
Family Medicine Clerkship	81.2%
Community Medicine Clerkship in a Rural Setting	21.7%
Community Medicine Clerkship in an Inner-City Setting	12.9%
Ambulatory Block Assignment During an Internal Medicine Clerkship	57.6%
Ambulatory Block Assignment During a Pediatric Clerkship	64.3%
Ambulatory Block Assignment During General Surgery Clerkships	18.8%
Ambulatory Block Assignment During an OB/GYN Clerkship	34.2%

Source: AAMC Graduating Medical Student Questionnaire, 1999–2000.

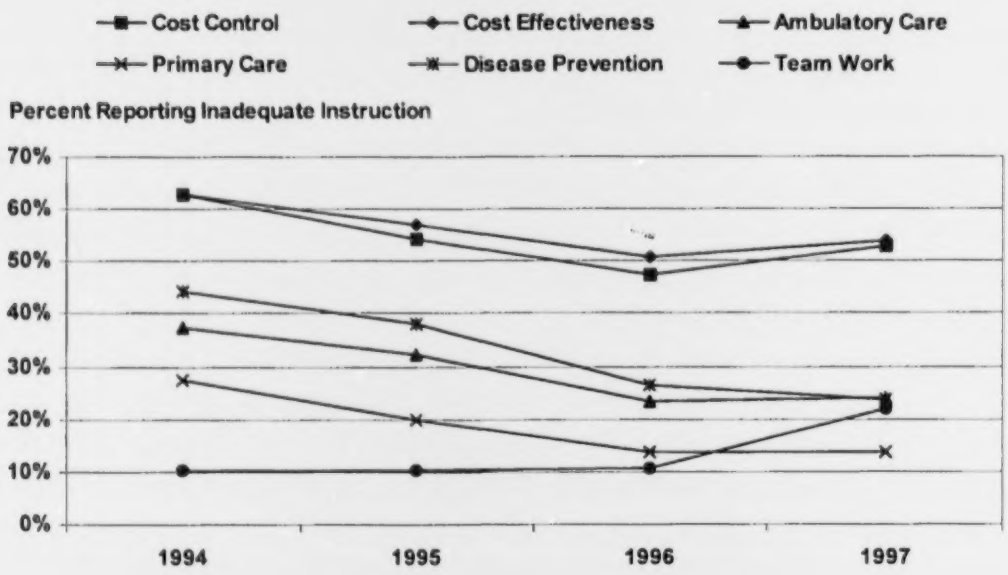
From 1984 to 1994, the percentage of all medical students who participated in one or more ambulatory care clerkships increased from 48.8 percent to 72.2 percent.[70] Also, from 1993 to 1997 the average number of weeks that medical students spent in ambulatory settings (regardless of whether they were participating in a clerkship) increased from 11 to 15.[71] The number of medical schools that required all students to complete a family practice clerkship increased from 67 in 1990 to 87 in 1994 to 101 in 1998.[72]

Unfortunately, no systematic studies assess the success of these curricular reforms in preparing students to be more effective practitioners. However, there are data on students' perceptions of the adequacy of their preparation in the core curricular areas noted above. Such reports have been shown in a number of studies to be valid indicators of the success of curricula[73,74,75,76,77] and may accurately reflect the competence of teachers, changes in students' own knowledge and comprehension, and their future educational performance.[78,79,80,81,82,83]

In an analysis of data from the questionnaire administered annually by the AAMC to all graduating medical students, the Task Force found that from 1994 to 1997, the percentage of graduates who felt they received inadequate instruction in primary care decreased by half, from 27.6 percent in 1994 to 13.7 percent in 1997 (Figure 5). Similar but smaller decreases were found for ambulatory care (37.4% to 23.9%), cost control (62.9% to 52.9%), cost effectiveness (62.7% to 53.9%), and disease prevention (44.4% to 23.7%). However, the percentage who felt they received an inadequate amount of instruction in teamwork remained relatively constant from 1994 to 1996 (10.2% to 10.6%) and then increased (to 21.8%) in 1997.[84]

So far as we know, these analyses are the only empiric evidence on the effectiveness of recent curricular reforms at the undergraduate level, and it is definitely encouraging. However, these data also indicate the need for additional work to reduce the proportion of students who feel they are leaving medical school with insufficient preparation to master the critical challenges facing modern practitioners.

Figure 5
Percentage of Medical School Graduates Reporting Inadequate Instruction in Curriculum Content Areas Relevant to Managed Care, 1994–1997



Source: Data from 1994-1997 Graduating Medical Student Questionnaire. Analysis by Campbell, Weissman, and Blumenthal, Institute for Health Policy, Massachusetts General Hospital.

Reforms in Graduate Medical Education

The Thirteenth Report of the Council on Graduate Medical Education (COGME) called for residency programs across the U.S. to "fundamentally revise the preparation of their graduates to reflect the changing practice environment while sustaining the quality of current teaching programs."[85] Common recommendations for reforming GME emphasize training in epidemiology and population-based care, disease prevention and health promotion, and computer skills. To contend with a rapidly changing practice context, physicians need to be comfortable with ethical issues, patient advocacy, teamwork, and conflict resolution.

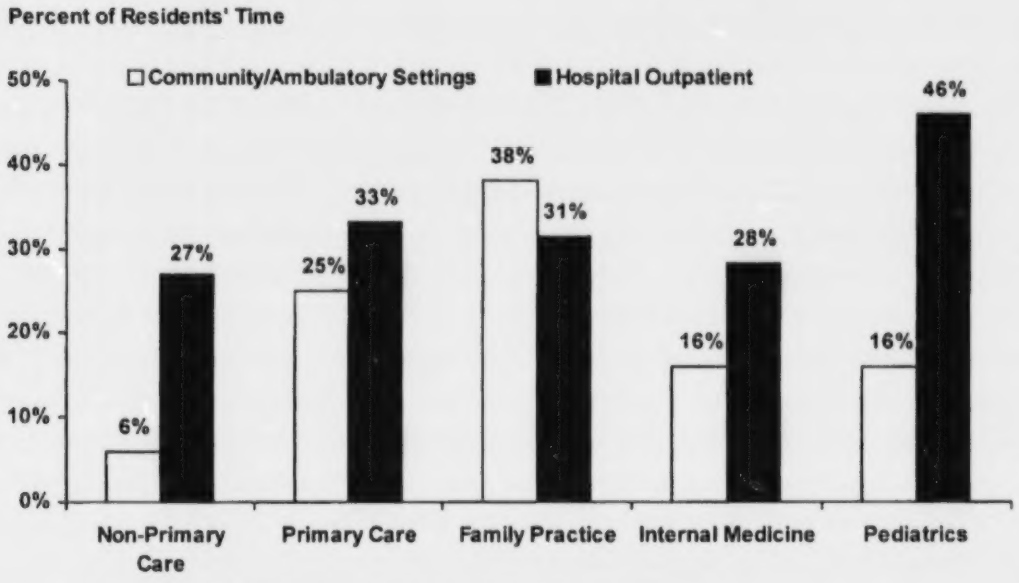
Some of these concerns have been translated into requirements by the ACGME, for increased ambulatory training during residency, increased continuity of care experience, and reduced residency workloads to promote opportunities for learning.[86] Along with these requirements, the ACGME and the American Board of Medical Specialties (ABMS) recently developed a comprehensive "toolbox" of methodologies that can be used for evaluating residents' clinical skills. These include a brief description of each method and information about its proper use and psychometric qualities. The

toolbox, though still a work in progress, represents the first systematic approach toward the appropriate selection and use of medical education evaluation methodologies.

As in the UME area, systematic national data on the response of AHCs to calls for change in GME and to new accrediting requirements are incomplete. The task of collecting this data is complicated by the fact that different specialties require different training experiences, and assessments of AHCs' responses must, therefore, be specialty specific. In the area of primary care, where many groups have advocated more extensive ambulatory training, the data suggest that considerable progress has been made. A good deal of this information derives from regular surveys of the directors of GME training programs, who are surveyed annually by the AMA. Results of the 2000 survey suggest that primary care residents (family practice, internal medicine, pediatrics) spend 25 percent of their time in community (nonhospital-based) ambulatory settings compared with 6 percent for non–primary care residents (Figure 6). Among those in primary care, family practice residents spend 38 percent of their time in community ambulatory settings compared with 16 percent for both internal medicine and pediatrics.[87] Annual surveys of program directors by the American Board of Internal Medicine document an increase in ambulatory training for internal medicine residents from 14 percent of their time over three years in 1986–87 to 37 percent of their time in 1997–98.[88]

Since residency directors' reports may not accurately reflect how residents actually spend their time, the 1998 Commonwealth Fund Survey of Residents in AHCs asked trainees directly how their time was distributed across a variety of settings. For eight specialties surveyed, including some non–primary care disciplines, residents reported spending 17 percent in hospital-based ambulatory settings, 10 percent in emergency rooms, 8 percent in nonhospital-based ambulatory settings.[89] For primary care residents, reported amounts of training in ambulatory areas were comparable to figures provided by training directors in AMA surveys.

Figure 6
Percentage of Time Spent in Non-Inpatient Care Settings by Resident Physicians in Postgraduate Year 2 or Higher Positions, by Type of ACGME Accredited Programs, 2000



Source: AMA Annual Survey of GME Programs, JAMA Medical Education Issue, 2000.

Finding 8. AHCs seem to have succeeded in preserving the quality of their educational missions from environmental and financial pressures.

A critical question for medical education in the 1990s was whether the tumultuous health care environment had adversely affected medical education. As noted, many anecdotal reports and the Task Force's case studies suggest that the clinical environment has become unreceptive to medical education, threatening the direct and indirect subsidies and supports on which AHCs' educational mission depend.

To gauge the effects of such threats on AHCs' educational functions, the Task Force conducted a number of new analyses. A common theme of these studies was to examine whether indicators of the quality or content of medical education varied with geographic characteristics, especially the level of price competition and managed care penetration in AHCs' local markets. The Task Force hypothesized that, in areas of higher price competition and/or higher managed care penetration, AHCs' educational mission might be under greater stress. The Task Force studies used existing secondary data sources

as well as primary data collected in the Commonwealth Fund's 1998 Survey of Residents in AHCs.

Undergraduate Medical Education

To judge the effects of environmental forces on UME, the Task Force examined the relationship between market characteristics and students' scores on standardized exams administered by the National Board of Medical Examiners (NBME) from 1993 to 1996. These exams are taken by virtually all physicians-in-training at three points in time: following their first year of medical school (STEP 1 exams), late in their third year of medical school (STEP 2 exams), and during their first year of residency (STEP 3 exams). Many medical schools use student scores on NBME exams as a measure of educational quality, and virtually all states require physicians to pass these step exams as a prerequisite for medical licensure.[90]

Unadjusted data showed that students and first-year residents at AHCs in markets with high managed care penetration tended to have higher scores than those in markets with lower managed care penetration. However, after adjusting for students' past educational attainment and other factors, no significant differences in NBME scores by managed care penetration were evident (Table 5).

Table 5
Adjusted and Unadjusted Scores on NBME Exams by Research Intensity and Managed Care Penetration, 1993–1996

Market Competitiveness[a]	Unadjusted Means			Adjusted Means[c]		
	UME		GME	UME		GME
	STEP 1	STEP 2	STEP 3	STEP 1	STEP 2	STEP 3
High (>40%)	215[b]	213[b]	213[b]	211	209	209
Medium (20%–40%)	213[b]	208	208	212	206	207
Low (1%–20%)	211	208	208	212	208	208

[a] Market competitiveness was measured by level of HMO enrollment.

[b] $p<.001$ compared with low group.

[c] These means were adjusted to account for MCAT scores (verbal reasoning, physical sciences, and biological sciences as continuous variables and writing sample as a categorical variable), GPAs (science and other), matriculating class cohort, dummy variables to capture students who took exams earlier or later than usual, and the research intensity of the medical school as measured by NIH ranking.

Source: Analysis by E. Moy at the AAMC.

These means were adjusted to account for Medical College Admission Test (MCAT) scores (verbal reasoning, physical sciences, and biological sciences as continuous

variables and writing sample as a categorical variable), GPAs (science and other), matriculating class cohort, dummy variables to capture students who took exams earlier or later than usual, and the research intensity of the medical school as measured by NIH ranking. In other analyses, the Task Force examined the relationship between market characteristics and medical students' ratings of the quality of their training in the seven CCAs described in Finding 7. In some content areas, students reported lower levels of inadequacy in highly competitive markets (preparation for cost-control and cost-effectiveness assessments) and in other areas higher levels of inadequacy (primary care, disease prevention). These findings suggest that for CCAs, the amount of competition and managed care in local markets tends to positively affect some educational tasks and adversely affect others. However, there was no consistent trend suggesting that market forces resulted in a deterioration of UME experiences.

Graduate Medical Education

In an analysis of results from the 1998 Commonwealth Fund Survey of AHC Residents, residents' perception of their level of preparedness to manage a range of specialty conditions and of the quality of their educational experiences were examined in relation to the competitiveness of local markets. No significant differences were found between residents in highly competitive and less competitive markets.[91]

The Task Force also examined relationships between managed care penetration in local markets and internal medicine residency graduates' performance on the ABIM exams from 1996 to 1998. The average pass rate (indicating better performance) on the ABIM boards was slightly higher for the 59 programs located in markets with high managed care penetration (85.2%) compared with programs in markets with medium managed care penetration (84%) and those in markets with low managed care penetration (82.5%). Thus, there was no evidence that level of managed care penetration affected this particular indicator of residents' educational success. However, the analysis did not take into account differences in the previous educational attainment of examinees by level of managed care penetration. Internal medicine programs in the most competitive markets may attract residents with higher grade point averages, MCAT scores, and better scores on their STEP exams, resulting in higher pass rates on the certification exams.

Several interpretations of these analyses, which show no apparent adverse effect of managed care penetration on the educational mission of AHCs, are possible. One is that the measures used by the Task Force were not sensitive or specific enough to detect those effects. A second possible interpretation is that AHCs have stretched themselves to

overcome the pressures created by managed care (i.e., faculty are working harder and institutions are tapping reserves to preserve their educational missions). A third possible explanation is that changes in private markets are not threatening the educational mission of AHCs.

We cannot choose definitively among these interpretations. Lack of comprehensive data about the educational mission of AHCs currently is a problem. However, our several dozen case studies produced fairly consistent testimony from deans and faculty suggesting that the second of these explanations plays a role at some AHCs. If correct, this observation suggests that AHCs have been able to protect their educational missions. However, it is not known whether the stresses created by these extra efforts will be manageable over time.

Finding 9. AHCs vary considerably in their use of educational innovations and reforms and in addressing the perceived inadequacies in their curriculum.

As noted in Finding 3, numerous opportunities exist to modernize the way in which students and residents are taught at the UME and GME levels. These opportunities involve new technologies and didactic theories. There is also a pressing need to change the culture of academic health centers to make education a higher priority. Based on the limited data available—almost all at the UME level—AHCs seem to vary widely in their adoption of these techniques and approaches.

The most comprehensive data regarding adoption of new educational strategies and technologies at the UME level was collected in 2000 by the AAMC and published as a supplement to the journal *Academic Medicine*. The data consist of qualitative statements regarding current curricula at each medical school in the United States and Canada.[92] The Task Force conducted a qualitative "content analysis" of these data, focusing on reported approaches to the financial management of medical education, the employment of explicit learning objectives and outcomes in curricula, efforts to improve the prestige of educational missions, and the incorporation of computers into various aspects of the UME curriculum (Table 6). It should be noted that the data reported in *Academic Medicine* were not collected with the intent of performing comparative analyses across programs, which means that results must be interpreted with caution.

Table 6
Frequency of Use by AHCs of Selected Learning Technologies

Learning Technology	U.S. Medical Schools Reporting Use of the Technology (%)
Students required to own a computer	31
Computer-based instruction	65
Computer-based evaluation	37
Use of standardized patients	81
Small-group learning	80
Problem-based learning	57
Interdisciplinary course work	27

Source: Analysis of the September 2000 Supplement to *Academic Medicine* by the Institute for Health Policy at MGH.

For educational missions to be successful, they must be effectively managed. The first element in effective management is developing a process for allocating resources in relationship to need and performance. This, in turn, requires some kind of budgeting process. Many medical schools have not budgeted systematically for medical education or other missions, which in part explains the difficulty encountered by the Task Force in finding data on the costs associated with various educational reforms. The AAMC and other groups have been encouraging medical schools to adopt mission-based budgeting—defined as a management approach that aligns revenues from an activity with the costs or expenditures of that same activity. For example, under mission-based budgeting, administrators should be able to identify and manage the revenues earned by and the costs that result from educational activities. Based on published reports from the schools, it is difficult to reliably determine the number of institutions engaged in mission-based budgeting. However, the author of the AAMC report stated, "While there are more schools that have defined budgets for their educational programs now than was the case in the early 1990s, there is still a long way to go before all schools can say that their educational missions are supported by their own budgets."[93]

The development of systematic learning objectives is also recognized as a useful approach to managing and improving educational activities. In 1996 fewer than 20 percent of medical schools had an established set of learning objectives or outcomes for undergraduate medical education.[94] That proportion had increased to 63 percent by the year 2000 (Table 7). However, only 12 percent reported that those objectives guided the content of the UME curriculum and 6 percent of schools reported that the objectives were considered in the evaluation of students.

Table 7
Characteristics of Undergraduate Medical Education, 2001

Characteristic	Medical Schools	
	Number	Percentage
Value of Teaching		
1. Have minor awards for teaching[a]	77	64.7
2. Have major awards for teaching[b]	4	3.4
Learning Outcomes		
1. Set of formal learning outcomes/objectives for UME[c]	75	63.0
2. Objectives guide the development/reform of the curriculum	14	11.8
3. Objectives guide student evaluation[d]	6	5.0
Application of Computer Technology		
1. Students required to own a computer	37	31.1
2. Computer-based instruction	77	64.7
3. Computer-based evaluation[e]	44	37.0

Note: Numbers are based on reports by 119 U.S. medical schools. Canadian medical schools were excluded.

[a] Minor awards consist of recognition for teaching in the form of society membership, certificates, public recognition, cash awards, and incentives up to $5,000.

[b] Major awards for teaching consist of monetary awards or incentives greater than $5,000.

[c] School that reported having a set of formal objectives/outcomes for their students. Example: Johns Hopkins University, "The school uses a set of 11 objectives to guide measuring student outcomes."

[d] A university that uses outcomes for evaluation. Example: the University of Florida, "Competency attainment has become the currency of our curriculum and student evaluation. Grades and achievement of competencies are now used to evaluate students."

[e] Computerized exams are given to students. Example: the University of Colorado, "The PCC uses...computerized testing to assess students' knowledge, skills, and behaviors."

In addition to changing criteria for promotion (discussed above), one way to increase the priority that faculty assign to educational activities is to recognize and publicly acknowledge excellence in this field. Sixty-five percent of medical schools reported that they provide minor awards for excellence in teaching; the awards consisted of plaques, certificates, society memberships, and other forms of public recognition including cash prizes/incentives up to $5,000. The AAMC report concluded, "there are many awards given for excellence in teaching.... This change is positive. Even so, there is room for the academic societies and faculty members themselves to place a higher value on the activity of teaching."[95]

One approach to enhancing the prestige of educational activities is being implemented at the University of California, San Francisco, and Harvard Medical School. Each school recently created an Academy of Medical Educators, described as "a highly selective, honorific organization which promotes teaching excellence" by committing $10 million to fund endowed chairs of education as well as multi-year teaching grants. The

goal of these academies is to provide resources, including salary support, to advance the educational activities of its members and enhance the overall quality and stature of teaching in the AHC.[96] A similar initiative is under way at the University of Illinois at Chicago.[97]

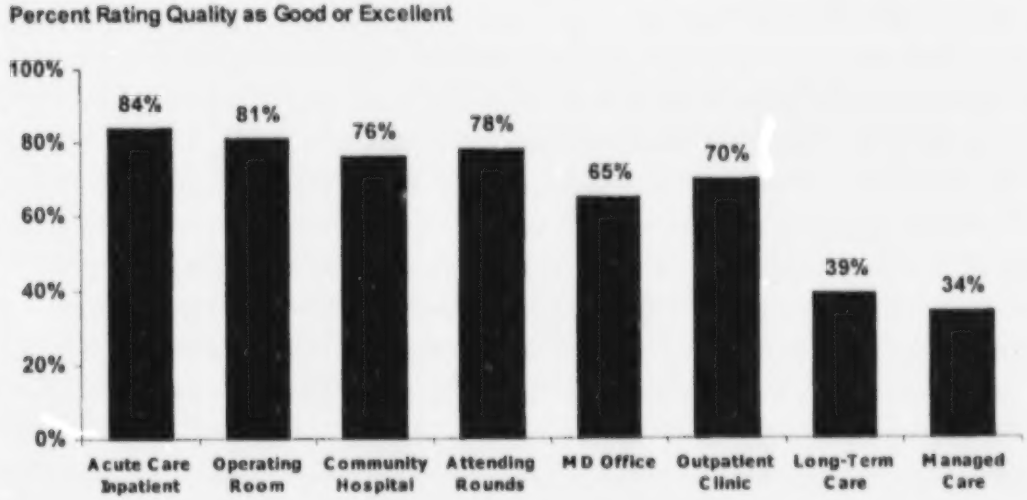
Another area of potential innovation in education involves the adoption of the new learning technologies and strategies discussed earlier in this report, which include PBL, standardized patients, interdisciplinary programs, and small-group learning. Nearly two of three schools now use some computer-based instruction. Based on AAMC data, the most commonly used technologies were standardized patients (81%) and small-group learning (80%). Only small numbers of schools (27%) use interdisciplinary course work.

Taken together, these and other data (including data presented above on the increased use of ambulatory care experiences in UME and GME) paint a picture of considerable, but uneven, progress in reforming medical education at the UME and GME level.

Finding 10. The quality of GME instruction in nonhospital settings lags behind that found in traditional settings.

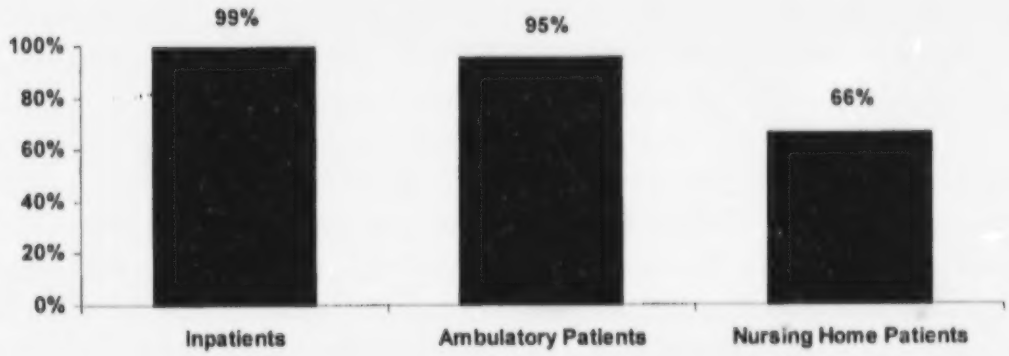
Data from the 1998 Commonwealth Fund Survey of AHC Residents indicate that more than 75 percent of residents gave good or excellent ratings to the instruction they received in acute care settings, operating rooms, community hospitals, and attending rounds (Figure 7). However, fewer respondents felt they received good or excellent instruction in outpatient clinics (70%), physicians' offices (65%), long-term care facilities (39%), and managed care organizations (34%). As shown in Figure 8, a significantly smaller percentage of primary care residents (66%) felt somewhat or very prepared to care for patients in nursing homes compared with the number who felt prepared to care for inpatients (99%) or ambulatory patients in general (96%).

Figure 7
Residents' Ratings of Quality of Instruction by Site, 1998



Source: 1996 Commonwealth Fund Survey of Residents. Analysis by M.Gokhale at HP. Regression adjusted percentages controlling for differences due to gender, specialty, IMG status, market stage, and US News rank. Percentages differ significantly at p<.05.

Figure 8
Residents' Rating of Their Preparedness to Care for Different Types of Patients, 1998



Source: 1996 Commonwealth Fund Survey of Residents. Analysis by M.Gokhale at HP. Regression adjusted percentages controlling for differences due to gender, specialty, IMG status, market stage, and US News rank. Percentages differ significantly at p<.05.

A number of possible explanations exist for these differences: (1) training programs in nontraditional settings are new and thus less well-developed, than those in traditional settings; (2) faculty in nontraditional settings face severe demands for clinical productivity that compromise their teaching; and (3) teaching is inherently more difficult in managed care settings because instruction must be compressed into a brief outpatient visit rather than a several-day inpatient stay. It may also be that residents perceive the patient mix in a hospital setting as more stimulating and exciting than that in nontraditional locations such as doctors' offices and nursing homes. Further, there is a disincentive for AHCs to offer educational experiences in nontraditional settings because the AHCs do not receive IME and DME payments typically attached to Medicare payments for care when teaching occurs in the ambulatory setting. Whatever the explanation, these data suggest the need for AHCs to pay greater attention to the quality of educational experiences of residents in out-of-hospital care.

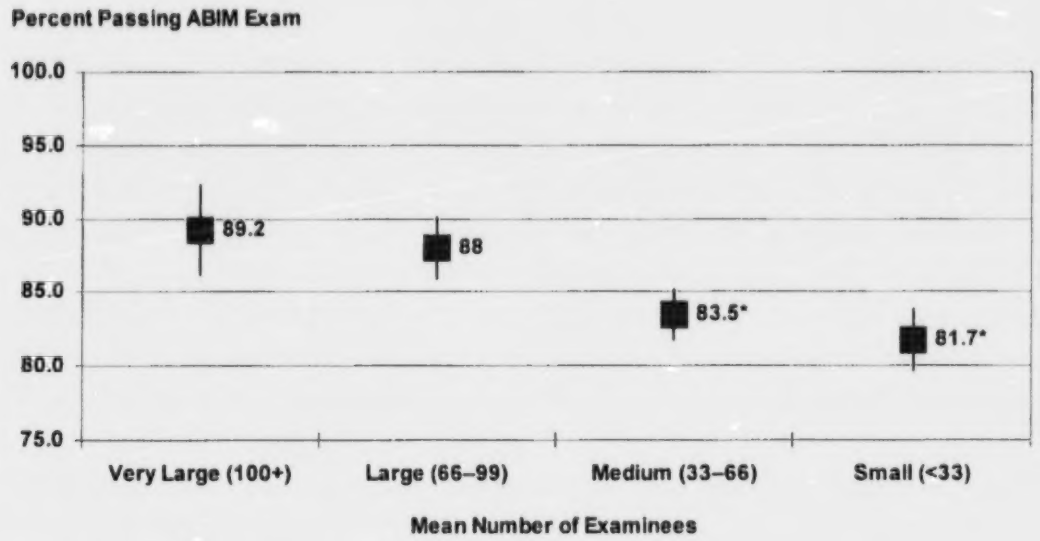
Finding 11. The quality of training may vary systematically from one training program to another.

There is some evidence that residency programs vary systematically in how well they prepare graduates. For example, at least in internal medicine, small programs seem to perform less well than larger programs. An analysis of data from the ABIM[98] demonstrates a relationship between the size of internal medicine programs and resident performance on the ABIM certification examination. As indicated in Figure 9, from 1996 to 1998 small internal medicine programs (defined as having less than 33 examinees) had a pass rate of 81.7 percent compared with 83.5 percent for medium programs, 88 percent for large programs, and 89.2 percent for very large programs.[vi]

These findings should be considered exploratory, since the analysis could not control for potentially confounding variables. Also, the fact that pass rates may be higher in some programs than others does not mean that the lower scoring programs are producing unqualified physicians. However, these findings highlight the importance of conducting more definitive analyses in the future, using multiple measures of program performance.

[vi] The analysis was performed on the universe of internal medicine programs. Although hypothesis testing is not normally applied in these situations, statistical tests can provide a reference for the relative size of the effect. In this case, the differences were determined to be significant at the $p<.05$ level.

Figure 9
Mean Pass Rates for Internal Medicine Programs on the ABIM Certification Exam by Program Size, 1996–1998

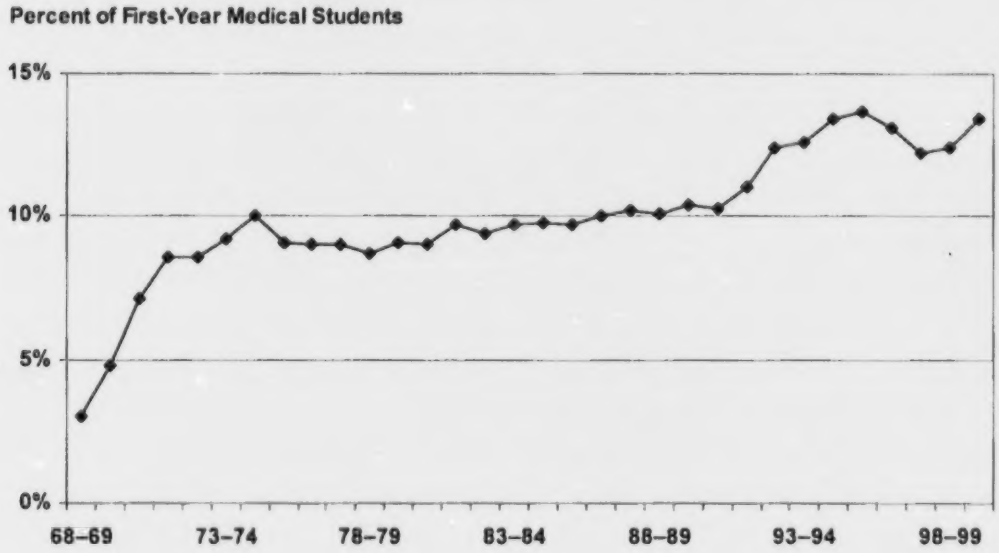


* p<.05 compared to large and medium programs.
Data: 1998 ABIM Pass Rate Report for Internal Medicine Programs Aggregated for Years 1996-1998. Analysis by E. Campbell at MGH.

Finding 12. The number of underrepresented minorities in medical schools remains below their proportion in the population as a whole.

Over the years, medical schools have been challenged to increase the number of underrepresented minorities in training to join the medical profession. The most sensitive indicator of the success of this goal is the percentage of first-year medical students from these minority groups (defined here as African Americans, Mexican Americans, Native Americans, and Puerto Ricans). The percentage of first-year medical students from these minorities increased fourfold from 3 percent in 1968 to 13.4 percent in 1998 (Figure 10). Given that African Americans, Native Americans, and Hispanics currently make up 23 percent of the American population, it seems clear that these groups continue to face obstacles to entering the medical profession.[99] However, we are unable to determine the extent to which these obstacles may be attributable to other factors such as socioeconomic status and previous educational experiences.

Figure 10
Trends in the Percentage of First-Year Medical Students Who Are Underrepresented Minorities, 1968–2000



Source: Data adapted from Tables b6 and b8 in AAMC Data Book 2000 and JAMA Medical Education Issue.

Finding 13. Data are inadequate to gauge the performance of AHCs in the conducting their educational missions. In several areas that are critical for assessing how well AHCs conduct their education missions, basic data are lacking.

- *The cost of educational activities.* It is impossible to determine accurately how much AHCs invest in capital improvements for UME and GME and how many faculty full-time equivalents are involved in education or associated salary and benefit expenses.

- *The curricular content of UME and GME programs.* Though the LCME and RRCs undoubtedly review such data as part of their periodic reviews, comprehensive longitudinal data that would allow comprehensive assessment of the evolution of educational missions are not publicly available.

- *The comparative performance of educational programs at the UME and GME levels.* Scores on NBME and ABIM exams are currently the only publicly available endpoints that AHCs and policymakers can review to assess the outcomes of the medical education process on a program-by-program basis. NBME exams test whether students have acquired the minimum knowledge necessary to become competent physicians, and thus miss many relevant areas of performance, such as interviewing skills, physical examination skills, and the ability to manage patients in actual practice settings. The ABIM exams involve only internal medicine specialists. Through request to the AAMC, outside analysts can gain limited access to annual surveys of graduating medical students, and survey responses can be used to identify differences across UME programs. However, such proposed analyses must be reviewed and approved by the AAMC, and student perceptions of their educational experiences constitute only one measure of educational performance.

In the absence of such data, it is difficult or impossible for AHCs to manage their missions optimally or to demonstrate convincingly the need for external assistance in response to environmental pressures. Lack of reliable information also handicaps policymakers when designing new initiatives or analyzing what effects past policies may have had on the educational missions of AHCs.

IV. CONCLUSIONS AND PRINCIPLES

The Task Force's review of the educational mission of AHCs leads it to adopt the following conclusions and principles that guide the recommendations stated in the final section of the report.

Conclusion 1. The content and quality of physician training will remain vital for the foreseeable future to the health of the American people, their peace of mind, and the effective functioning of the American health care system.

Most Americans continue to rely heavily on physicians to provide services that can improve their health, treat their illnesses, and relieve their suffering. For the foreseeable future, alternative sources of health information and services are unlikely to replace completely personal attention from competent, well-trained, caring medical doctors. Thus, the quality and content of physician training are vital to the health and welfare of the American public. Furthermore, the power of physicians in the health care system means that their behaviors and views are important to facilitating constructive change in the organization and financing of health care systems. Those views and behaviors often take root during the process of medical education, especially at the graduate level.

Conclusion 2. AHCs play a critical role in the training of American physicians and have a number of unique advantages for performing this task.

While physician training can and does occur in the non-AHC environment, the nation is heavily and appropriately dependent on AHCs to assure the excellence of our physicians. As a site for the education of physicians ready for medical practice in the 21st century, the AHC offers unique advantages. The AHC is able to integrate the education of physicians, the conduct of biomedical research, and the provision of a wide variety of clinical services. At a time when lifelong learning is essential to the competence of physicians, linking education with research conveys required skills and provides role models that help new physicians internalize those skills. At a time when the population of the United States displays unprecedented and increasing diversity, many AHCs provide a rich and varied clinical experience that facilitates training in cultural competency.

Conclusion 3. Government has a legitimate concern with assuring the competence of our physician workforce and thus with the training missions of AHCs.

Average patients lack the ability to assess fully and accurately the skills of their physicians. This is unlikely to change in the near future. Thus, government has a role in protecting patients from inadequately trained physicians. Government has traditionally exercised that role in direct and indirect ways. Directly, it has required physicians to complete certain basic educational requirements as a condition of licensure. Indirectly, it has sanctioned private medical organizations to accredit undergraduate and graduate medical programs attended by physicians-in-training. Direct and indirect regulation of training requires prolonged clinical experiences before physicians can be licensed or certified in a specialty. This helps to assure the excellence of the physician workforce, but also adds costs to the care provided in institutions that participate in UME and GME.

Conclusion 4. AHCs face significant challenges in fulfilling their educational roles.

An exponential increase of new knowledge makes medical education more exciting, fulfilling, complex, and demanding than ever before. Dazzling new biomedical discoveries are expanding the ability of physicians to treat illness and relieve suffering. Knowledge is increasing not just in the biomedical sciences but in other areas that have become important for physicians to master: improving quality and efficiency of care and service, promoting health and preventing disease, and functioning effectively in health care organizations. Furthermore, the existence of new pedagogic practices and technologies—for example, simulation, standardized patients, Internet-based educational resources, and problem-based learning—make it possible to educate physicians more effectively than in the past.

Incorporating new content and methods into the educational process constitutes a significant challenge for AHCs. Curricula must be reformed. Faculty must acquire new skills. New facilities must be constructed. The locus of education must be shifted from inpatient to outpatient and community-based settings. All these changes create organizational stress and entail new expenditures.

These expenditures add to other costs associated with AHCs' educational missions. In some markets, the costs of educational missions have made AHCs vulnerable to the

price pressures exerted by managed care organizations. These price pressures have led to demands for greater productivity on the part of faculty and may have led to financial stresses for the institutions in which they practice. In the view of some, the result has been an environment that has become unreceptive, and in some cases even hostile, to teaching.

Conclusion 5. The available data are insufficient to judge the performance of AHCs in discharging their educational responsibilities beyond establishing a minimum level of competency.

Little reliable and useful data exist on the process or outcomes of medical education within AHCs. There are no systematic, published data on the comparative content of UME and GME across institutions, the extent to which the curricula make use of new technologies or educational theories, or the outcomes of educational activities in terms of the competency of residents who complete GME at each institution The lack of such information makes it difficult to assess reliably the status of the educational missions of AHCs, to judge how much those missions are affected by the environment at each AHC, or to make a fully convincing case for policies that might assist with the education of physicians. The lack of good data on the educational mission of AHCs also makes it extremely difficult to compare educational approaches for the purpose of identifying best practices.

Principle 1. AHCs should be held accountable for their performance in educating the nation's physicians.

As the setting for medical education moves outside of the hospital and methods of education expand to include innovative teaching strategies, the assurance of quality becomes increasingly important. Academic health centers should be able to demonstrate that they are providing physicians with the skills and attitudes that are likely to serve the health care needs of the American people and contribute to the quality and efficiency of our health care system.

Principle 2. The extra clinical costs associated with the educational missions of AHCs should be borne broadly and fairly by the beneficiaries of the educational activities of these institutions.

The lack of good data on the status of the educational missions of AHCs should not obscure what we do know. Providing the educational experiences required to produce a competent workforce adds to the clinical costs of AHCs. In a price-competitive

environment, organizations that bear these costs without offsetting revenues are at a potential disadvantage. If society wishes physicians to continue to undergo current levels of clinical training, it will have to help AHC facilities with those costs. Because the benefits of an educated medical workforce accrue to all segments of society, the costs should be borne broadly. This argues for a governmental role in funding the clinical costs associated with medical education. In exchange for such funding, AHCs should manage the efficiency of their educational mission to the same degree they manage the efficiency of their clinical enterprises.

V. RECOMMENDATIONS

The Task Force's recommendations are based on the findings, conclusions, and principles presented in this report. Recommendations are addressed to the three critical parties in the medical education enterprise: AHCs, accrediting bodies, and government.

Recommendations for AHCs

Recommendation 1. AHCs should include the continuous improvement of medical education among their highest priorities.

AHCs historically have been extremely adept at incorporating new scientific and clinical knowledge into the curricula of UME and GME. The Task Force is confident that the management and faculty of AHCs will continue to devote themselves to meeting this challenge. However, the challenges of reforming medical education may be qualitatively more demanding than ever before. Thus, the Task Force believes that traditional, decentralized, ad hoc approaches to improving medical education may no longer be adequate to the task. The reform of medical education requires at each AHC the attention of leaders and influential preclinical and clinical faculty. As AHCs address the challenges facing medical education, special attention should be paid to those listed here.

1a. AHCs should continue to reform medical education to prepare young physicians for the changing demands of medical practice in the 21st century.

The practice of medicine in today's environment requires that physicians be schooled in providing new types of care, in different locations and in new ways.

- The body of knowledge relevant to disease prevention and health promotion continues to grow rapidly, and physicians need to be well-schooled in this content, as well as in the skills necessary to address the behaviors and social circumstances at the root of many of our health care issues. Many young physicians do not feel confident counseling patients on such subjects as smoking, weight reduction, safe sex practices, domestic violence, and drug and alcohol use and abuse. AHCs must work actively to prepare young physicians to perform these tasks.

- An increasing proportion of care is provided in community-based settings. AHCs must continue current efforts to move training experiences to such settings, while also developing innovative methods to provide uniform, high-quality educational experiences in the decentralized, variable community environment. This may require increased reliance on new educational technologies (see Recommendation 1b).

- An increasing proportion of physicians provide health care in organizations. To function optimally, physicians need skills that traditionally have not been included in medical education. These skills include: organizational behavior and management, interdisciplinary teamwork, group problem solving, communication across professional boundaries, and an understanding of how changing health care environments affect the welfare and strategic requirements of health care organizations.

- Society holds health care professionals and organizations more accountable than ever before. This means that as individual professionals and as members of organizations, physicians must be prepared to participate in quality improvement and cost-containment activities. For quality improvement, they must understand industrial quality management science and continuous quality improvement and the human and organizational factors that contribute to medical errors. To participate in cost reduction and responsible resource use, physicians must understand basic microeconomic and decision analysis techniques, such as cost-effectiveness analysis, cost-benefit analysis, and decision analysis.

- As a result of the consumer movement and the information revolution, many users of health care services have become extremely knowledgeable about their illnesses, and expect to be involved in the medical decisions that affect their lives. Physicians will need to understand how to ascertain their patients' wishes and how to incorporate patients into decision-making. This will require improvements in their knowledge of patient psychology and their interviewing and communication skills.

- In the lifetimes of physicians now in medical school, the minority populations of the United States will come to outnumber the population of European ancestry. As we have emphasized before, caring for patients of diverse ethnic, racial, cultural, and linguistic backgrounds will be a central challenge for physicians. Training in cultural competency should be included in the basic UME and GME curricula.

1b. AHCs should increase their use of new educational technologies in a cost-effective way.

Some of the new technologies relevant to medical education have been described in this report. These technologies have been adopted at varying rates by medical schools and clinical teaching facilities. Innovators deserve praise for leading the way in developing new educational techniques. AHCs that have not begun experimenting with these new approaches should quickly follow suit. The use of new technologies may offer assistance in mastering a number of the challenges facing AHCs. For example, telemedicine, distance learning, and Internet-based curricula could help to assure the quality of learning experiences for students and residents in decentralized community-based educational settings. Standardized patients can be used to teach students patient communication skills, including ways to elicit patient preferences for various treatments and treatment outcomes and ways to include patients in medical decision-making. Simulation provides an excellent technique for teaching teamwork and principles of error reduction.

1c. AHCs should continue to assist physicians to be lifelong learners.

It is likely that medical knowledge will continue to grow well into the future. As a result, physicians must be lifelong learners. Preparation for lifelong learning requires that AHCs help physicians to develop technological expertise in the use of computerized information storage and retrieval systems, stand-alone and on-line simulators, Internet-based learning, two-way interactive television, and other forms of distance learning. The use of these and other technologies may prove essential to physicians in gathering, organizing, interpreting, and implementing knowledge, which, in turn, will enhance the efficiency and effectiveness of future medical practice.

Recommendation 2. AHCs should develop new ways to measure the costs and quality of their medical education missions.

AHCs have little accurate data on the costs or quality of their educational missions, and this makes it extremely difficult to bolster appeals for external aid or to manage effectively their educational activities. The development of basic accounting systems that allow AHCs to measure the major costs associated with educating undergraduate and graduate physicians is essential to allocating educational resources. The Task Force realizes that such accounting systems will never be perfect. The fact that education in AHCs is produced jointly with research and patient care means that identifying the expenses associated

uniquely with education will never be fully possible. Nevertheless, more than traditionally has been done can be done. Both the AAMC and the University Health System Consortium have programs to develop ways of budgeting for separate missions within AHCs and isolating how funds flow within these institutions. To date, only a small number of AHCs have participated in these activities.

New data on the costs of medical education will likely stimulate the demand for good measures of overall quality. None currently exist. The best national measures to date rely on surveys of students, residents, and faculty. Other quality measures consist of learners' performance on national standardized tests, such as the USMLE STEP exams and specialty-specific certification exams. While these data provide a broad picture of educational quality, they do little to measure the actual competencies of students and residents. New measures of educational quality should be used to validate and investigate data presented in this report that instruction in nontraditional settings and small internal medicine programs is perceived to be lower quality.

Quality measurement in GME will be more complicated, given that residency programs produce a variety of types of physicians: primary care physicians and specialists, physicians who will work in hospitals and those who will work in ambulatory settings, and those who will engage in education and research versus those who will concentrate exclusively on patient care. New quality measures must adequately discriminate between the differential training needs and outcomes of these types of physicians.

Recommendation 3. AHCs should establish mechanisms that encourage faculty to engage in educational activities and to expand and improve their teaching skills.

Educators in AHCs do not receive the financial rewards or academic recognition accorded successful researchers and clinicians. To fulfill their educational missions, AHCs need to make education a viable career track for faculty by compensating, celebrating, and promoting them for excellence in teaching. Many AHCs have begun experimenting with promotional tracks for teachers and with awards for excellence in education. However, these practices are by no means universal, and subtle discrimination against excellent educators persists. These disincentives to improving the educational missions of AHCs must be overcome if they are to prepare students and residents adequately for the practice of medicine in the 21st century.

One way to encourage improvements in the status of teaching faculty may be to include educational leaders on senior governing boards of AHCs to represent the interests of educators in institutional decision-making. This participation in the governance of AHCs may facilitate communication between the education, research, and patient care enterprises. While such cross-mission communication may have occurred naturally in the past, under current pressures for clinical and research productivity, AHCs can no longer assume that faculty who do not teach understand and respect faculty for whom education is the primary activity.

In addition to encouraging faculty to teach, AHCs must ensure they have the proper skill sets to take advantage of new modes of teaching. AHCs must invest in the educational readiness of their faculty. One way is to provide protected time or tuition reimbursement for pursuit of advanced degrees in teaching. Another way is to provide avenues for all faculty members to learn how to teach. The Harvard Business School, for example, requires all junior faculty to work with senior faculty to learn how to construct teaching cases and how to use the case study method in classroom settings. There is a similar need for new medical school faculty to learn how best to apply PBL and the small-group method.

Recommendation 4. AHCs should increase efforts to recruit underrepresented minorities and to prepare young physicians to care for an increasingly diverse population.

AHCs have not met their own goals for recruiting members of underrepresented minorities into the medical profession. To a large extent, this failure represents a broader societal failure to educate successfully members of its minority populations, starting in the earliest grades. Nevertheless, AHCs will never meet their goals unless they continue, and if necessary redouble, efforts to attract underrepresented minorities to medical schools and residencies.

A more attainable goal for AHCs is preparing all physicians-in-training for practice in a society where citizens of European descent constitute a minority of the total population. Many major corporations provide training in cultural competency for employees. However, a multicultural curriculum is just beginning to be incorporated in medical schools and residency programs. Many AHCs are well positioned by virtue of the populations they serve to expose trainees to the problems of the many ethnic and racial

groups in our society. In the future, every medical school graduate, and every graduate of an AHC residency, should have been exposed to training in cultural competency.

Recommendation for Accrediting Organizations and Similar Groups

Given the important role that accrediting and professional organizations play in medical education in the United States, these groups have the potential to contribute substantially to improving medical education.

Recommendation 5. Accrediting organizations and medical professional organizations should take a leadership role in assisting AHCs to develop the methods needed to train physicians to be lifelong learners and should develop new capabilities to measure the costs and quality of the medical education mission.

The United States' mixed public-private system of regulating medical education assigns a significant role to such organizations as the LCME, the ACGME, the AAMC, the AMA, the ABMS, the NBME, and the boards of the medical specialty societies.

The Task Force notes and applauds the leadership role that these organizations have already taken in improving medical education, and encourages them to expand and accelerate their efforts. In the area of UME reform, the AAMC has undertaken the Medical School Objectives Project (MSOP) to assist medical schools to revise UME curricula and to produce physicians capable of meeting the nation's future health care needs. The recommendations of the MSOP have been implemented at numerous medical schools. Similar projects should be considered in areas related to measuring the costs of UME and developing improved ways to evaluate the content and quality of medical education. The work of the ACGME in the area of GME provides a useful benchmark. In addition, the AAMC could expand its data gathering activities in order to evaluate in a systematic manner the rate at which medical schools adopt and apply new educational techniques.

In the GME area, the ACGME and the ABMS have shown leadership by establishing a set of six general competencies that all resident physicians should be expected to develop. The ACGME plans to incorporate the assessment of those competencies into GME program reviews conducted by RRCs. In preparation for these new evaluation requirements the ACGME has produced a Toolbox of Assessment Methods (See Finding 7). These methods are being refined in pilot projects and

demonstrations, with input from specialty boards and medical experts. This effort is commendable. The ACGME, the ABMS, and similar organizations should take the next step by working with AHCs to identify best educational practice based on the results of assessments conducted with these new measurement tools.

Recommendations for Public Policy

Recommendation 6. Government should support research and development to produce valid and reliable measures of the costs and quality of UME and GME.

As we have noted, accountability for the costs and quality of medical education, and the effective management of this AHC mission, requires improved measures of the processes and outcomes of this activity. While AHCs, accrediting bodies, and professional organizations can assist in developing such measures, government has a legitimate role in supporting the development of reliable and valid methods for evaluating educational programs. As a primary supporter of medical education, government is a major beneficiary of improved measures, because these allow the public to judge what it is getting in return for its investment and to allocate educational funds more efficiently. The Task Force recommends that Congress authorize and appropriate funds to develop and implement improved measures of the performance of medical education. These funds should be administered by the Department of Health and Human Services under direct supervision of its Agency for Health Research and Quality. The peer review process of this agency will assure the rigor of funded work. A reasonable beginning level of funding would be $25 million a year.

Government can also play a valuable convening role by drawing together the many private and public groups—the AAMC, the ACGME, the NBME, the ABMS, the AMA, the Health Care Financing Administration, the Health Services and Resources Administration, and state governments—with an interest in the cost and quality of medical education. Acting collectively, such a consortium could provide valuable direction to a new research and development program.

Recommendation 7. A comprehensive public strategy is needed to cover the added costs of clinical care that accompany medical education activities. This strategy should establish a stable and explicit source of funding for medical education and should distribute these costs broadly and equitably among those who benefit from medical education. Further, this strategy should allow AHCs to compete with other providers of health care services.

Though economic theory may suggest that education does not add to the clinical costs of AHCs, the Task Force believes this conclusion is premature and should not be used when policy is being made. The perception among many participants in the education process, reinforced by the empiric data developed by the Task Force, suggests that medical education does increase the cost of clinical care at AHCs.

Over the long term, the public cannot expect private institutions in price-competitive markets to bear these publicly sanctioned costs without some assistance. In the past, Medicare and some state Medicaid programs have contributed a share of these costs, but private payers have been less willing over time to do so. As the power of managed care organizations recedes, AHCs may again be able to extract higher payments from private payers that, in prior years, enabled them to recover the clinical costs of medical education. However, experience over the past decade and the decreasing margins of AHCs (see Figure 3) suggest that this ad hoc method of funding medical education through cost-shifting—cobbling together funds from private and public payers—may not provide the secure, stable, and accountable source of payments that this vital social function deserves.

If policymakers and the public accept the argument that unregulated private markets cannot guarantee an optimal level of quality for our physician workforce, a strong argument exists for public support of the clinical costs imposed on private parties as a result of governmental regulation of the training process. Such public support could come in a number of forms. In the past, the Task Force has advocated the creation of an Academic Health Centers Trust Fund to support the extra clinical costs incurred by AHCs in association with their educational and other social missions. Other approaches are also feasible.

Whatever the mechanism used, public support should be secure, stable, and predictable from year to year. It should be associated with mechanisms that hold AHCs accountable for the quality and cost of their educational activities. The source of funds

should be broad-based, because all citizens benefit from assuring the quality of our physician workforce.

Recommendation 8. Until a strategy is developed, federal and state governments should continue to pay their fair share of the incremental clinical costs associated with UME and GME.

The perfect should not be the enemy of the good in the formulation of public policy. Until a more comprehensive, stable, secure, and fair approach to funding the clinical costs of medical education is established, federal and state governments that help defray such expenses should continue to do so. This means that the Medicare GME program should be continued. However, as it has noted in the past, the Task Force believes that a number of reforms would improve the effectiveness of the Medicare GME program. These include development of improved mechanisms for supporting the out-of-hospital costs associated with GME, a cap on the number of residents supported at a level equivalent to 110 percent of graduating U.S. medical students (in accordance with workforce recommendations of the Council on Graduate Medical Education), incentives to encourage training of general rather than specialized physicians, and equalization of DME payments to eliminate unjustifiable discrepancies across geographic areas.

At the same time, government policies must recognize that in many areas residents are an important albeit implicit source of care for poor and vulnerable patient populations. If numbers of residents are reduced, explicit mechanisms to provide care for these populations must be put in place.

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#265 *Key Issues in Community Hospital and Academic Medical Center Consolidations* (April 1998). David Altman, The Lewin Group. In an effort to inform community hospital leaders of the issues involved in hospital acquisitions and mergers, the author developed this primer to explain the motivations and principles involved in consolidations, to assess consolidation options and the critical points that must be addressed, and to provide lessons derived from institutions that have recently consolidated.

Published Articles

#500 *Preparedness for Clinical Practice: Reports of Final-Year Residents at Academic Health Centers* (September 5, 2001). David Blumenthal, Manjusha Gokhale, Eric G. Campbell, and Joel S. Weissman. *Journal of the American Medical Association,* vol. 286. According to this study, more than one of 10 medical residents say they feel unprepared to handle certain treatments and procedures relative to their specialties despite years of solid training.

The Relationship of Market Forces to the Satisfaction of Faculty at Academic Health Centers (September 2001). David Blumenthal, Nancyanne Causino, Eric G. Campbell, and Joel S. Weissman. *American Journal of Medicine,* vol. 111, no. 4. Copies are available from *American Journal of Medicine,* Box 0121, University of California, San Francisco, San Francisco, CA 94143-0121, Tel: 415-447-6100, Fax: 415-447-2799, E-mail: ajm@medicine.ucsf.edu.

#486 *Status of Clinical Research in Academic Health Centers: Views from the Research Leadership* (August 15, 2001). Eric G. Campbell, Joel S. Weissman, Ernest Moy, and David Blumenthal. *Journal of the American Medical Association,* vol. 286, no. 7. In this study, the authors report that close to half of the research leaders at U.S. medical schools do not consider their clinical research enterprises to be healthy or robust, and that they also question the overall quality of the clinical research being conducted.

Use of Preventive Care Services, Beneficiary Characteristics, and Medicare HMO Performance (Summer 2001). Jessica Greene, Jan Blustein, and Kelly A. Laflamme. *Health Care Financing Review,* vol. 22.

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procedures performed by major teaching hospitals have serious implications for the perceived efficiency of these institutions.

Academic Health Centers on the Front Lines: Survival Strategies in Highly Competitive Markets (September 1999). David Blumenthal, Joel S. Weissman, and Paul F. Griner. *Academic Medicine,* vol. 74, no. 9. In this article, the authors describe approaches that five academic health centers have taken to reduce costs, enhance quality, or improve their market positions since the onset of price competition and managed care. Copies are available from David Blumenthal, M.D., Institute for Health Policy, Massachusetts General Hospital, 50 Staniford Street, Boston, MA 02114.

#337 *Market Forces and Unsponsored Research in Academic Health Centers* (March 24/31, 1999). Joel S. Weissman, Demet Saglam, Eric G. Campbell, Nancyanne Causino, and David Blumenthal. *The Journal of the American Medical Association*, vol. 281, no. 12. This article looks at how increased competitive pressures on academic health centers may result in reduced discretionary funds from patient care revenues to support unsponsored research, including institutionally funded and faculty-supported activities.

#291 *New Bottles for Vintage Wines: The Changing Management of Medical School Faculty* and *Reforming the Structure and Management of Academic Medical Centers: Case Studies of Ten Institutions* (June and July 1998). Paul F. Griner and David Blumenthal. *Academic Medicine,* vol. 73, nos. 6 and 7. In the first article, the authors offer a comprehensive review of innovative practices to reform faculty responsibilities. Among the changes they describe are appointment letters that detail explicitly the roles and responsibilities of faculty members, annual performance reviews, promotions tied to performance, and enhanced communication with administrators. In the second article, the authors explore changes instituted by medical schools to improve their efficiency. Reforms highlighted include designing strategic plans for individual departments, streamlining and consolidating departments, improving teaching programs, and exploring new sources of revenue.

#339 *Relationship Between Market Competition and the Activities and Attitudes of Medical School Faculty* (July 1997). Eric G. Campbell, Joel S. Weissman, and David Blumenthal. *Journal of the American Medical Association,* vol. 278, no. 3. The authors argue that increased competitiveness of health care markets may hinder the capacity of academic health centers to conduct clinical research and foster the careers of young clinical faculty.

#338 *Relationship Between National Institutes of Health Research Awards to U.S. Medical Schools and Managed Care Market Penetration* (July 1997). Ernest Moy, Anthony J. Mazzaschi, Rebecca J. Levin, David A. Blake, and Paul F. Griner. *Journal of the American Medical Association,* vol. 278, no. 3. The authors provide evidence of an inverse relationship between growth in NIH awards during the past decade and managed care penetration among U.S. medical schools.

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